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MAGNETIC FIELD HOURLY AVERAGES FROM THE ROME-GSFC EXPERIMENT ABOARD HELIOS 1 AND HELIOS 2

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R. Buccellato, L.F. Burlaga, S. Cantarano,
C.S. Scearce, R. Terenzi, U. Villante

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MAGNETIC FIELD HOURLY AVERAGES FROM THE ROME-GSFC EXPERIMENT ABOARD HELIOS 1 AND HELIOS 2

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In this report we present the complete set of hourly averages the magnetic field measured by the Rome-GSFC experiment on lios 1 and Helios 2.

A general description of the Helios mission, designed to vestigate the innermost region of the solar system, has been ven by Porsche (1977). Here we recall only that Helios 1 and lios 2 were launched on December 10, 1974 and January 15, 1976, spectively.Their orbits were highly eccentric to allow small rihelion distances. For Helios 1 the aphelion, perihelion, and riod were 0.985 AU, 0.309 AU, and 190 days, while for Helios 2 ey were 0.983 AU, 0.290 AU, and 187 days, respectively.

A description of the Rome-GSFC experiment is found in Scearce al. (1975). Details on data analysis are given by Bavassano 976,1978), and Villante and Mariani (1977). The instrument sically consists of a triaxial fluxgate magnetometer. The timum range of measurement is selected among four different nges either by an automatic switch or by telecommand. A ermally oscillating actuator is used to reorient the sensor it by 90 degrees to evaluate the zero level of all three axes. e experiment has two different modes of operation, the detailed de and the the average mode, depending upon the telemetry bit te. At high rates the detailed mode is used: each measurement stored and transmitted without any data processing, the time solution varies from 0.07 to 1.5 seconds. At low rates the erage mode is used: individual measurements are processed by an board computer and average values transmitted with a time

resolution from 3 to 48 seconds.

Plots of all the hourly averages computed from the magnetic field measurements obtained during the mission are given in this report, separately for Helios 1 and Helios 2. The magnitude and the direction of the averaged field are plotted versus the number of solar rotations as seen from Helios, counted from launch. Each plot refers to one solar rotation. Its time duration is strongly affected by the variation of the angular velocity of the spacecraft along the orbit. As an indication, the solar rotation lasts about 27 days at the aphelion and about 40 days at the perihelion. In each plot the bottom panel refers to the field magnitude (in nanotesla), the central panel to the solar-ecliptic latitude THETA (inclination to the ecliptic plane, positive northward, in degrees), the top panel to the solar-ecliptic longitude PHI (azimuth on the ecliptic plane, zero toward the sun and counted counterclockwise as viewed from north, in degrees). At the bottom of each plot we indicate, every three days, the heliocentric distance (in AU), the heliographic latitude (in degrees), and the ecliptical longitude (in degrees, counted from the Sun-Earth line) of the spacecraft. The ecliptical latitude is very small, everywhere less than 0.03 degrees. The days indicated along the axis are days of year (1=January 1st). At the left lower corner the solar rotation number, referred to Helios, is given. At the top of each plot (just below the heading) the upper line of the upper panel is drawn double when the corresponding data were taken with the experiment in the average mode of

eration.

We give also a series of plots with the orbits of the two acecraft. The first of these plots shows an ecliptic projection the orbits of the two Helios and of the innermost planets. The ale around the sun-centered circle indicates heliographic itude within the ecliptic. Both spacecraft are south of the lar equator when to the right of the solar equatorial node ne, and north when to the left. In the other plots ecliptic ojections of the Helios orbit referred to the Sun-Earth line e given for all the time interval covered by the magnetic data. ck marks along the trajectory indicate the spacecraft position intervals of ten days.

References

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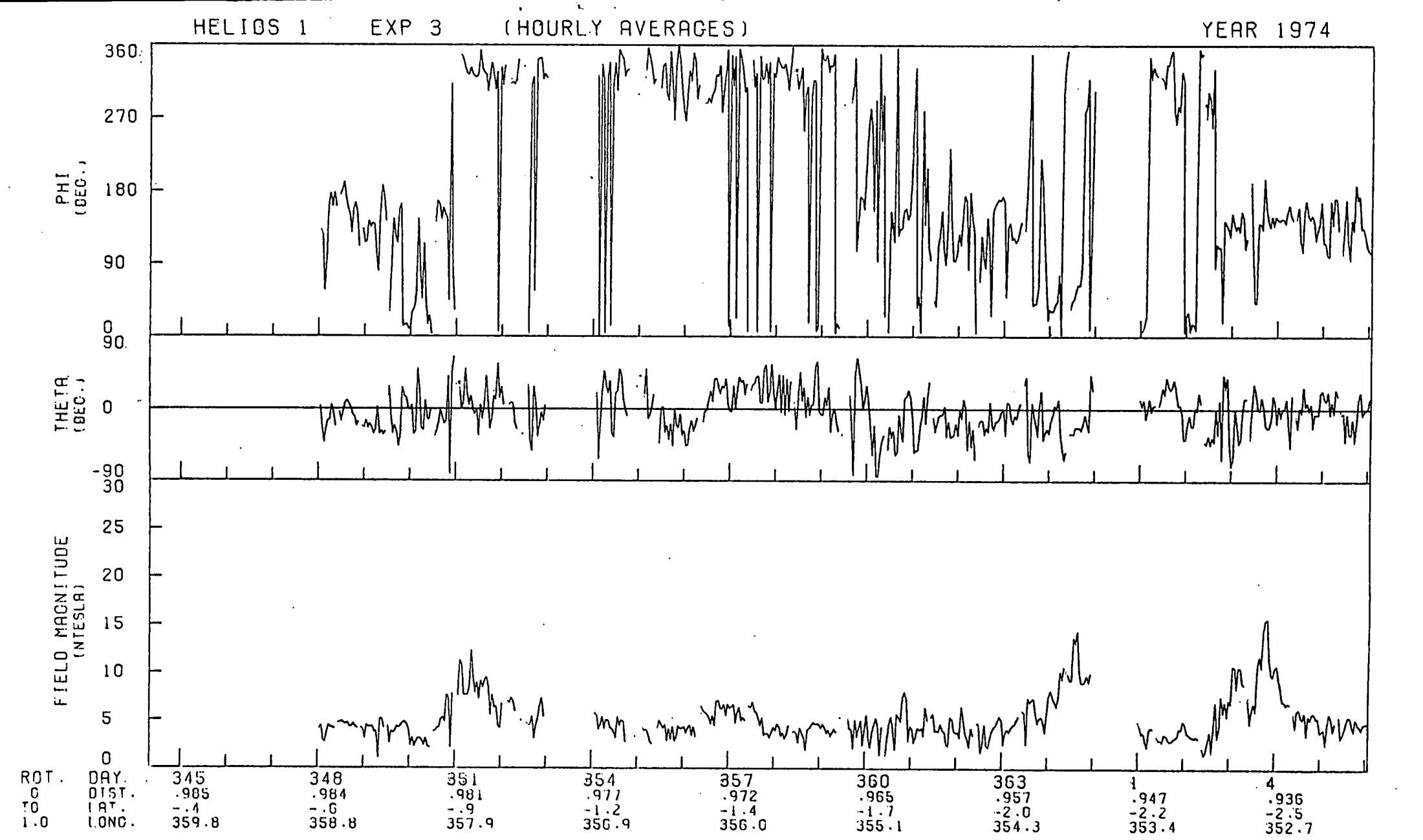
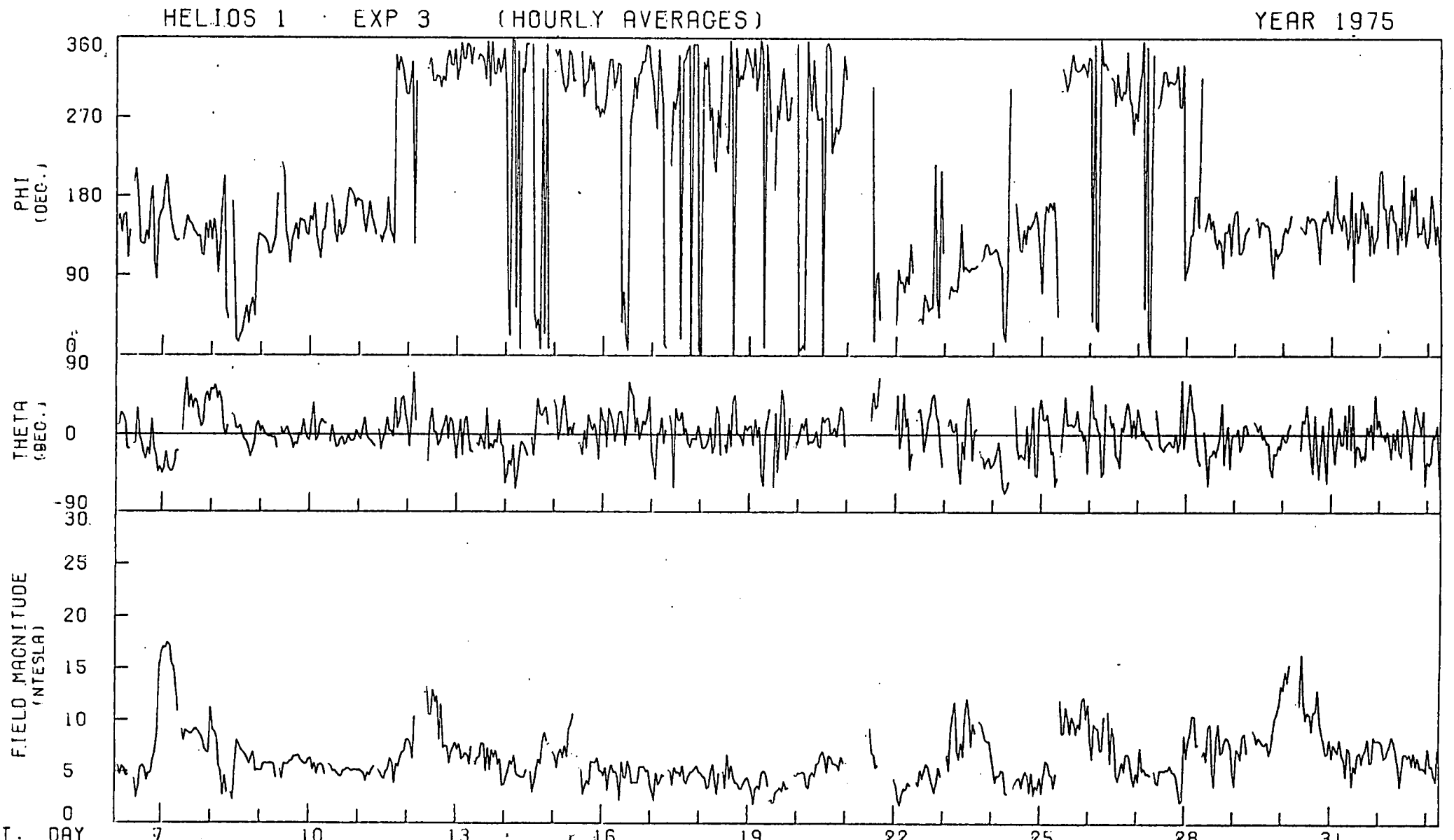
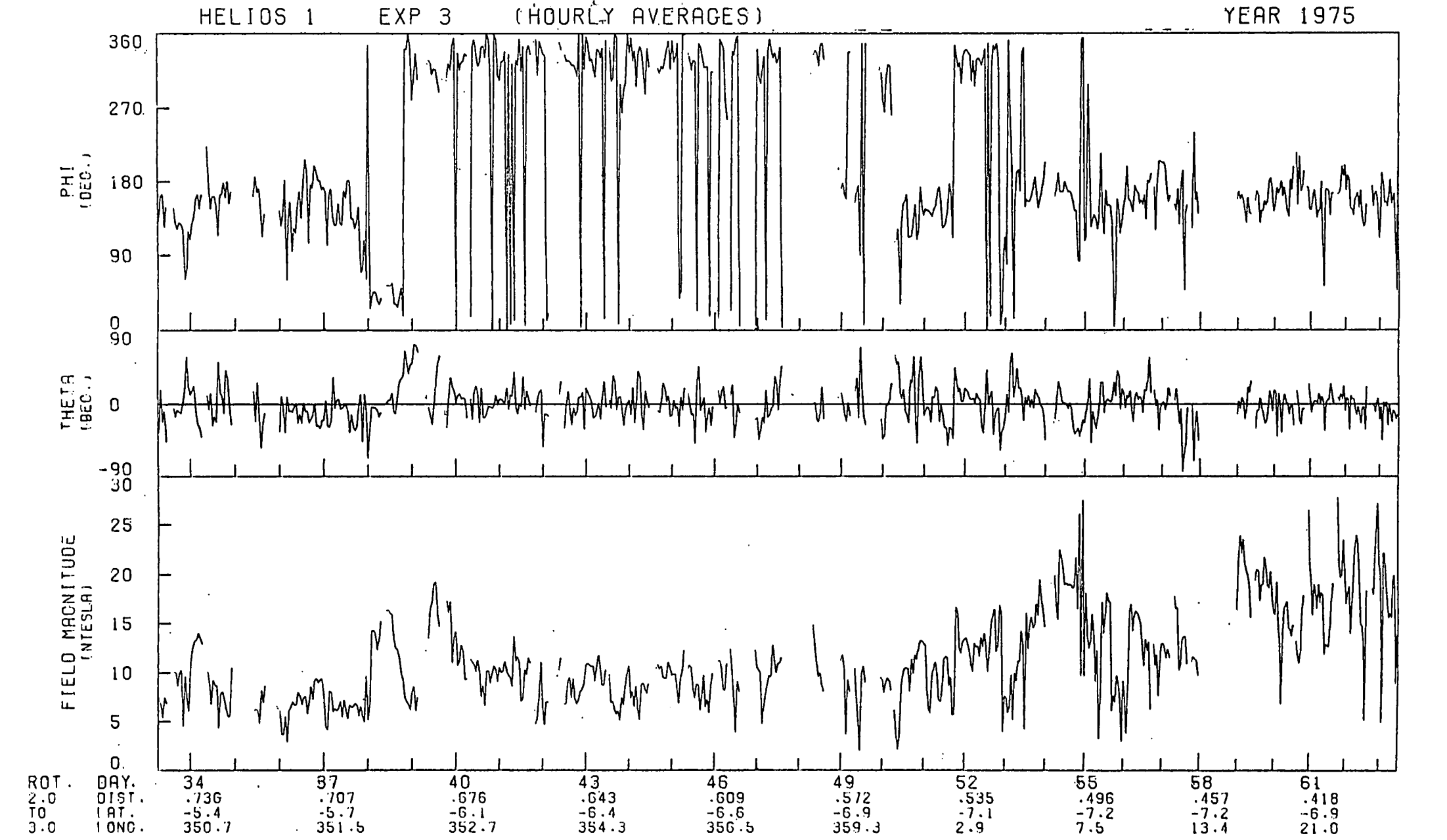
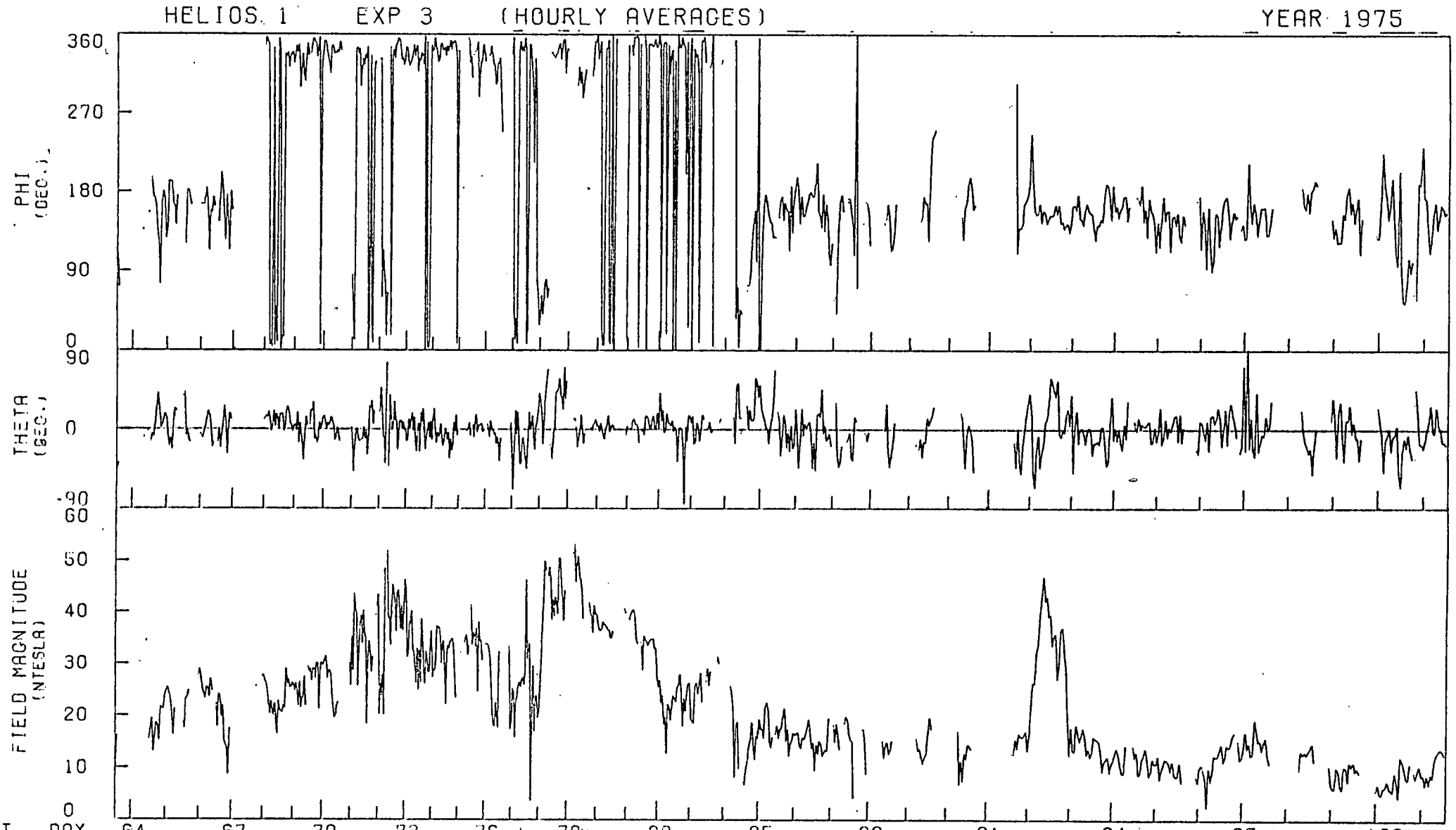
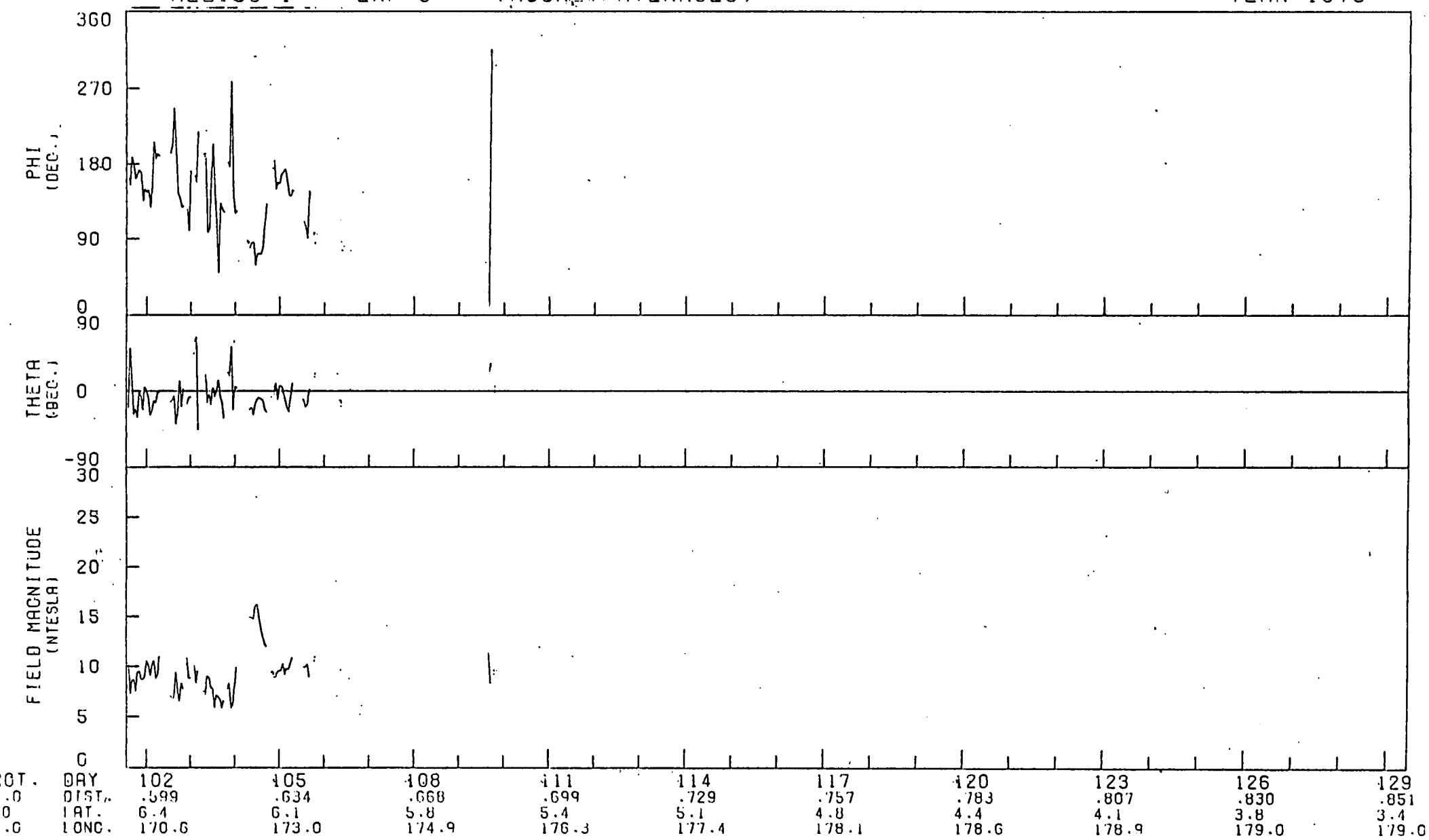
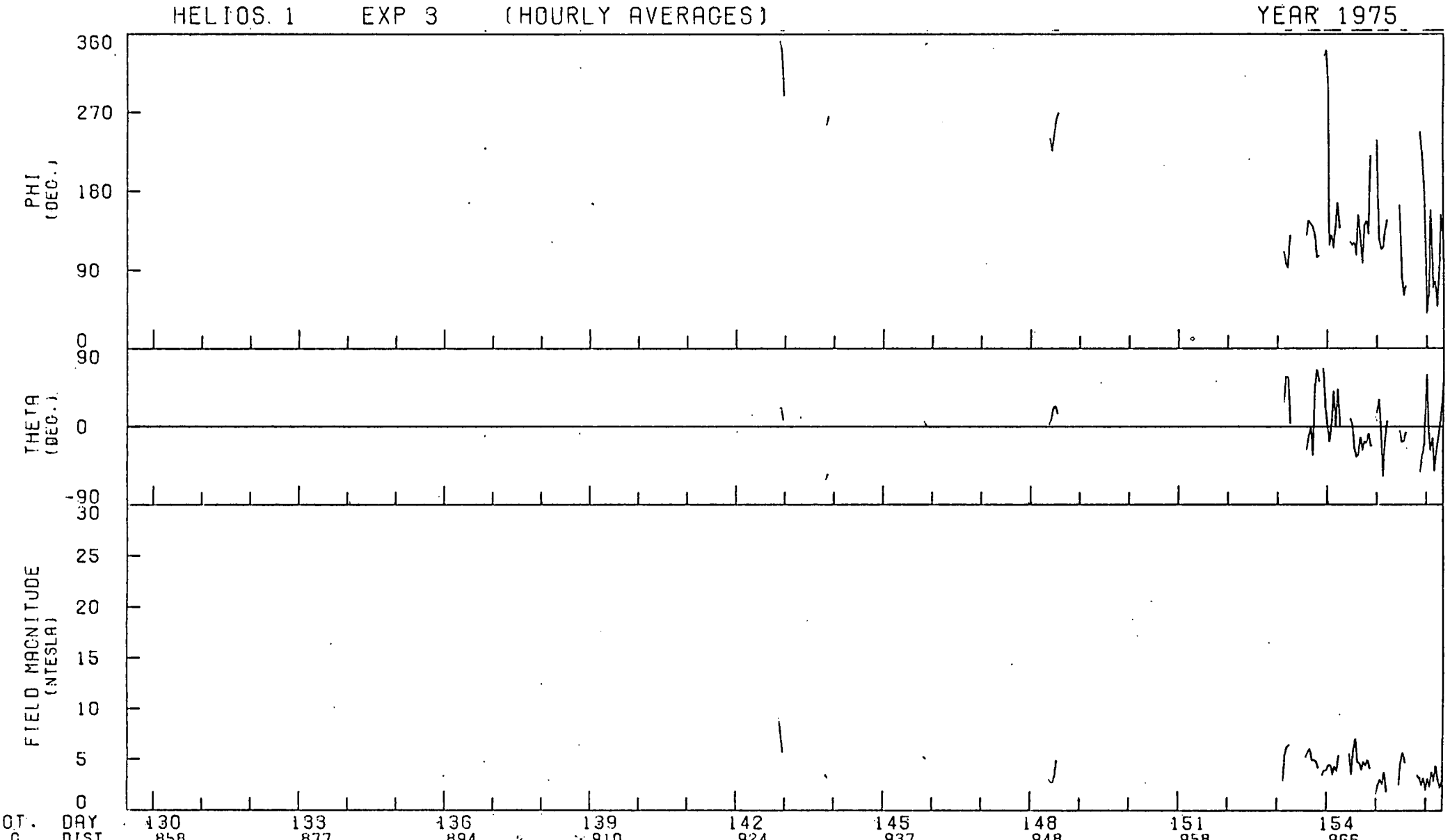

HELIOS 1 EXP 3 (HOURLY AVERAGES)
YEAR 1974
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY. 345 348 351 354 357 360 363 1 4
0 DIST. .985 .984 .981 .977 .972 .965 .957 .947 .936
TO LAT. -.4 -.6 -.9 -1.2 -1.4 -1.7 -2.0 -2.2 -2.5
1.0 LONG. 359.8 358.8 357.9 356.9 356.0 355.1 354.3 353.4 352.7

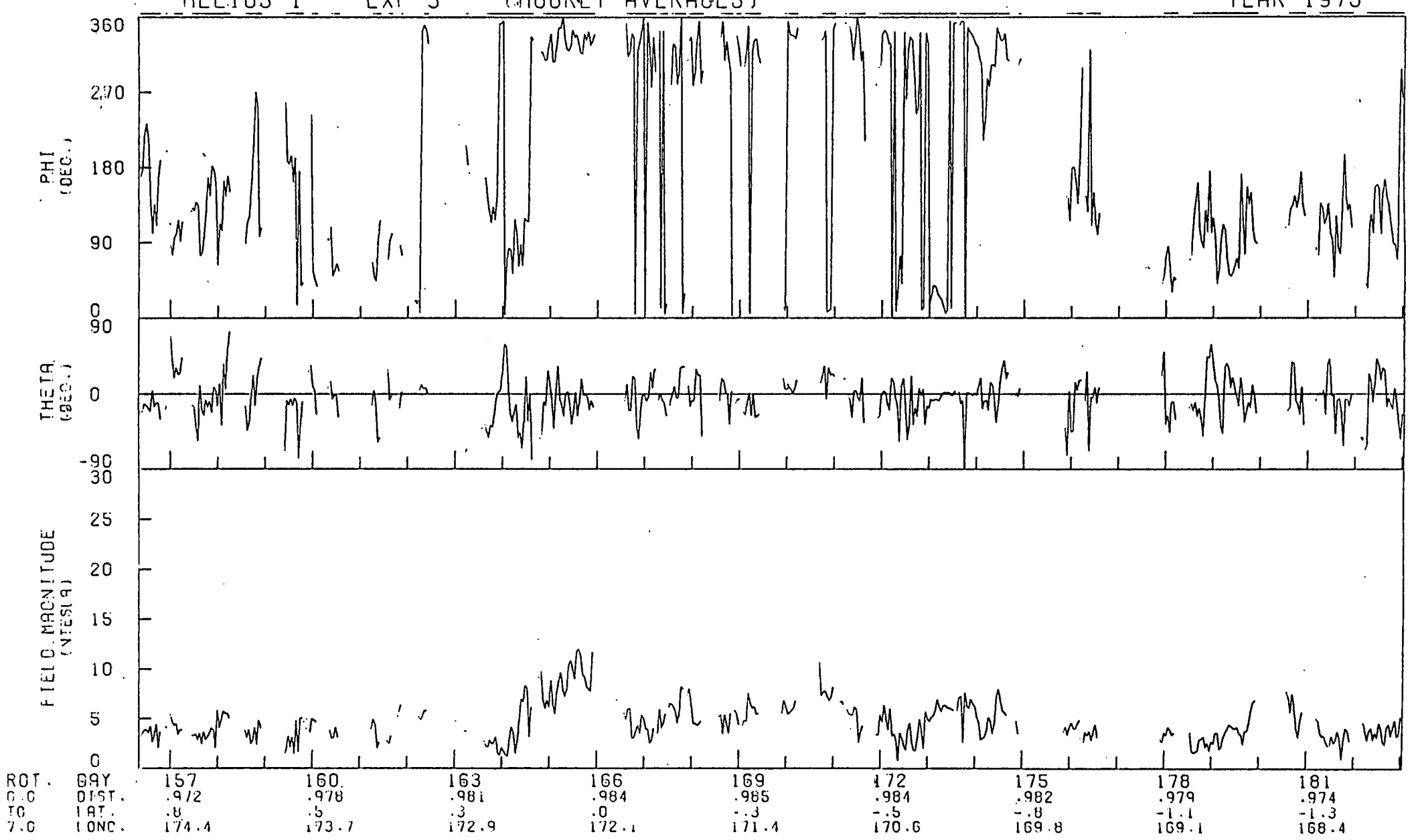

HELIOS 1 · EXP 3 (HOURLY AVERAGES)
YEAR 1975
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
7
10
13
16
19
22
25
28
31

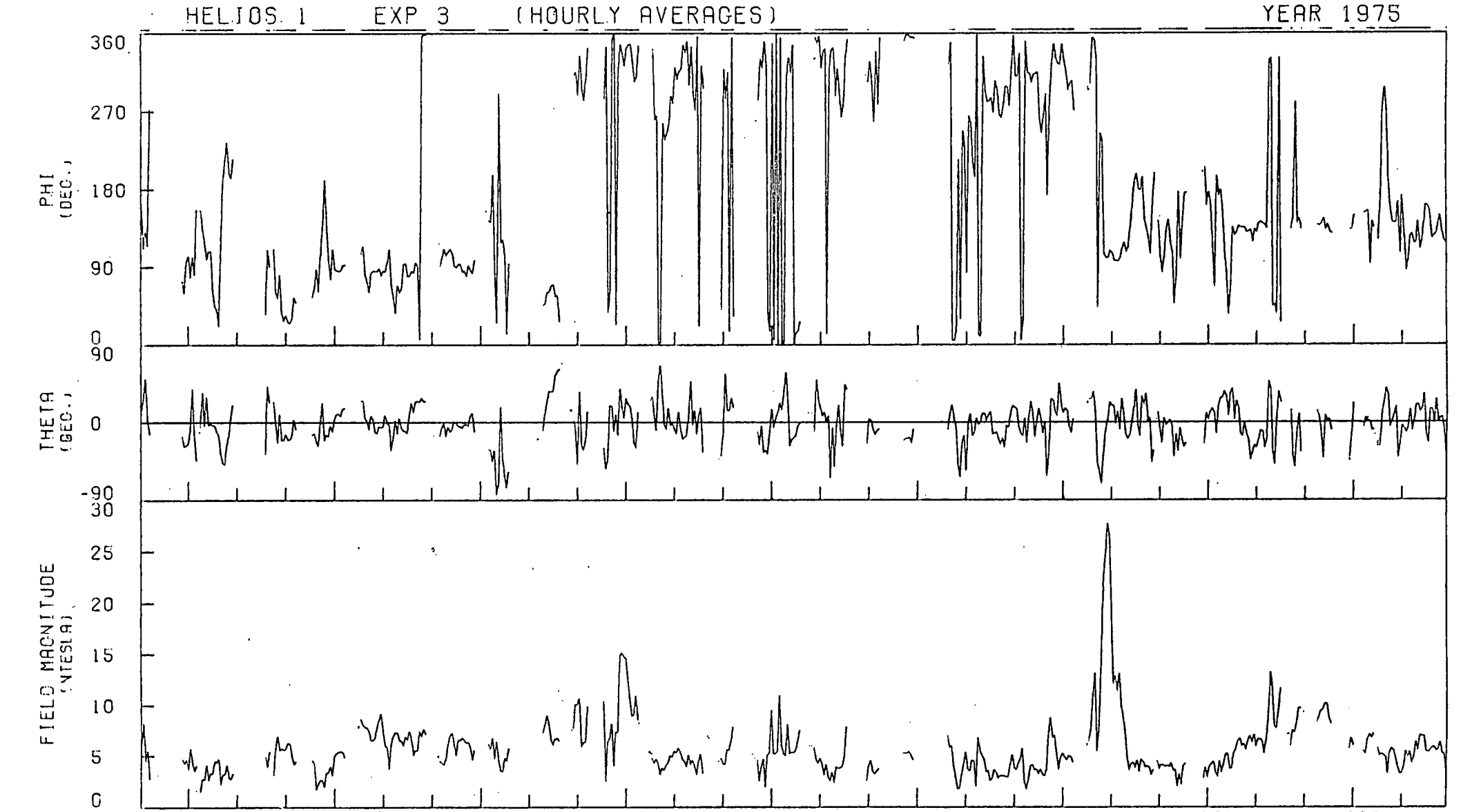

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1975
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY. 34 37 40 43 46 49 52 55 58 61
2.0 DIST. .736 .707 .676 .643 .609 .572 .535 .496 .457 .418
TO LAT. -5.4 -5.7 -6.1 -6.4 -6.6 -6.9 -7.1 -7.2 -7.2 -6.9
3.0 LONG. 350.7 351.5 352.7 354.3 356.5 359.3 2.9 7.5 13.4 21.0

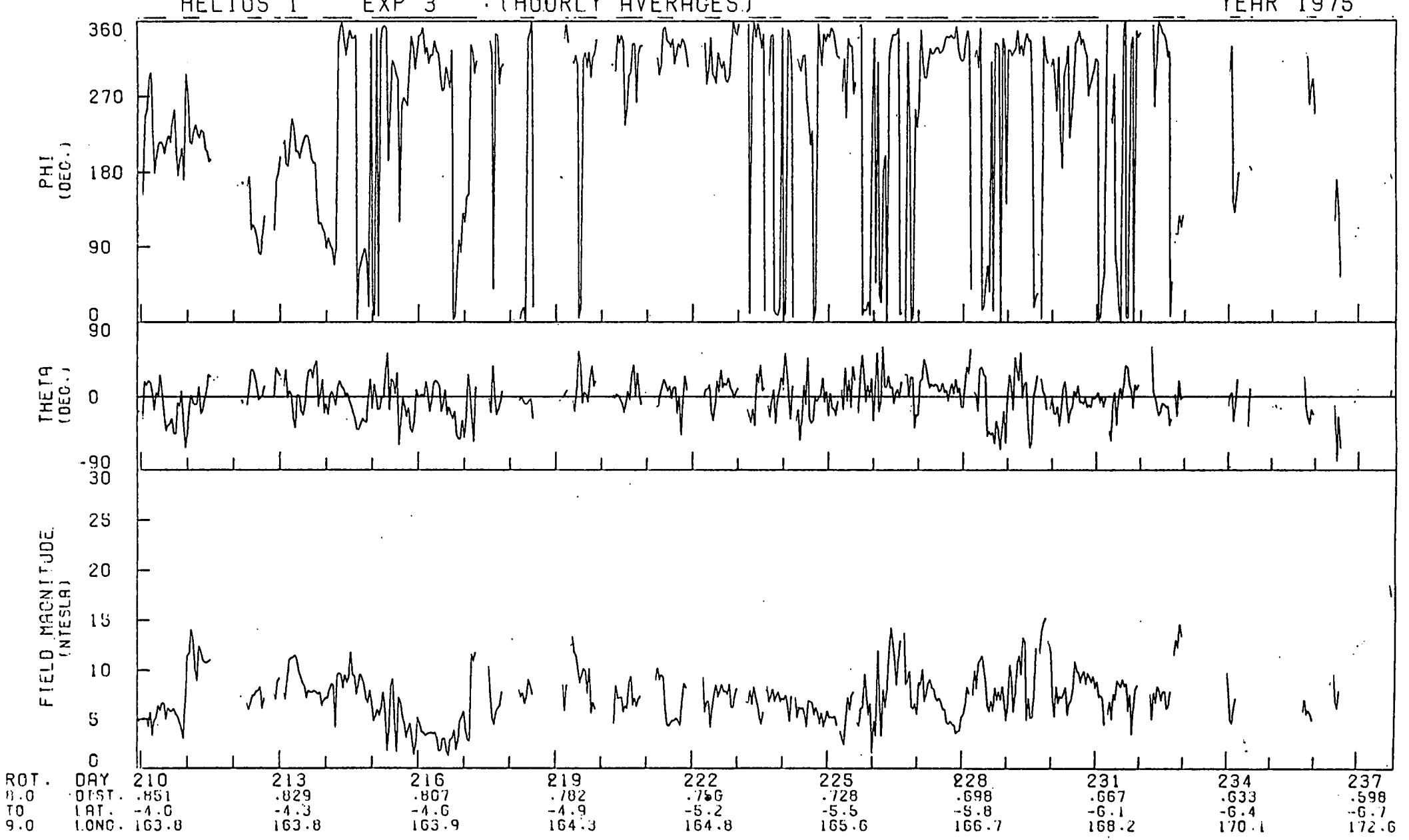

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1975
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY
64
67
70
73
76
79
82
85
88
91
94
97
100

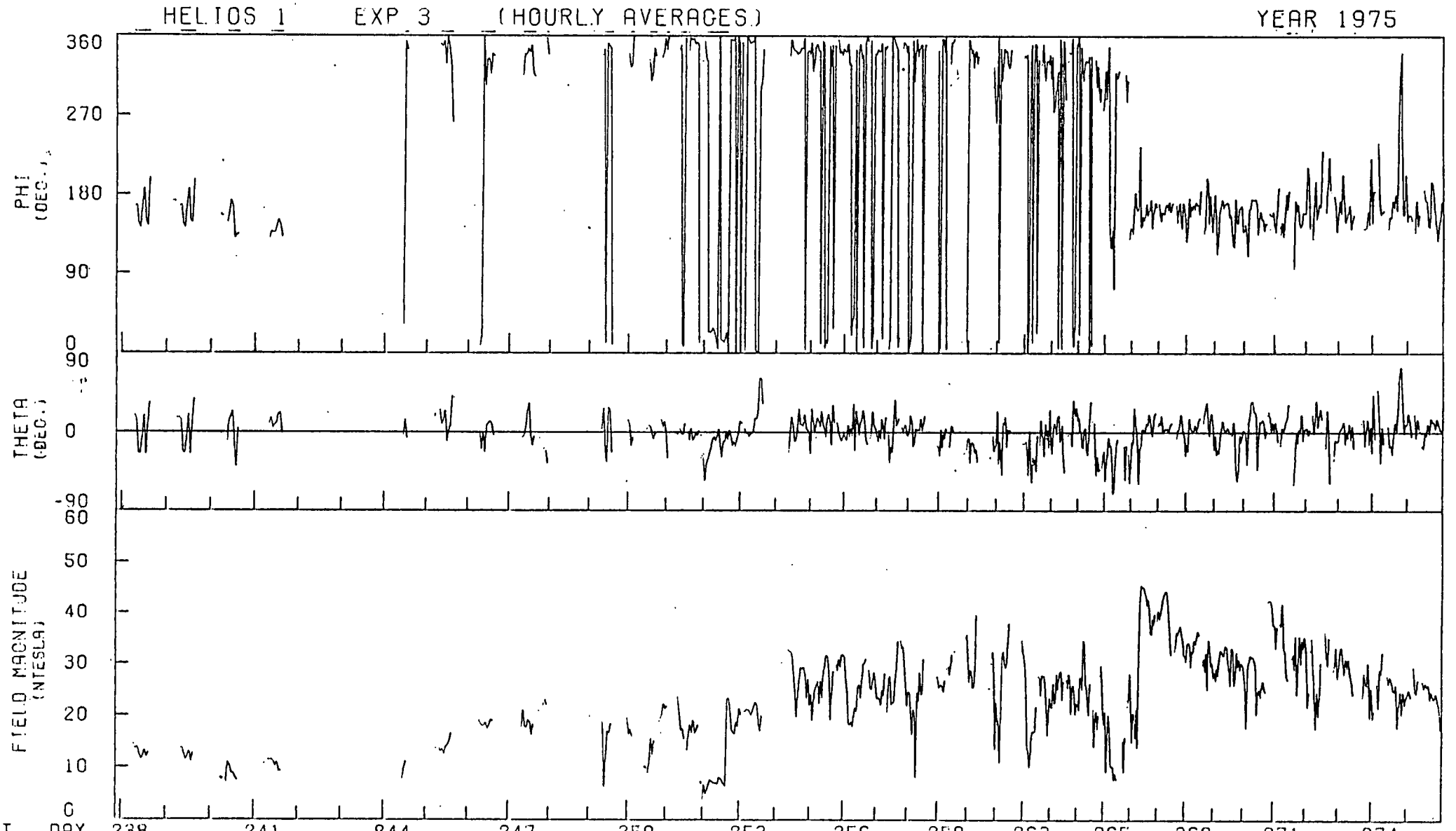

360
270
180
90
0
PHI
(DEG.)
90
0
-90
THETA
(DEG.)
30
25
20
15
10
5
0
FIELD MAGNITUDE
(NTESLA)
ROT. DAY 102 105 108 111 114 117 120 123 126 129
4.0 DIST. .599 .634 .668 .699 .729 .757 .783 .807 .830 .851
TO LAT. 6.4 6.1 5.8 5.4 5.1 4.8 4.4 4.1 3.8 3.4
5.0 LONG. 170.6 173.0 174.9 176.3 177.4 178.1 178.6 178.9 179.0 179.0

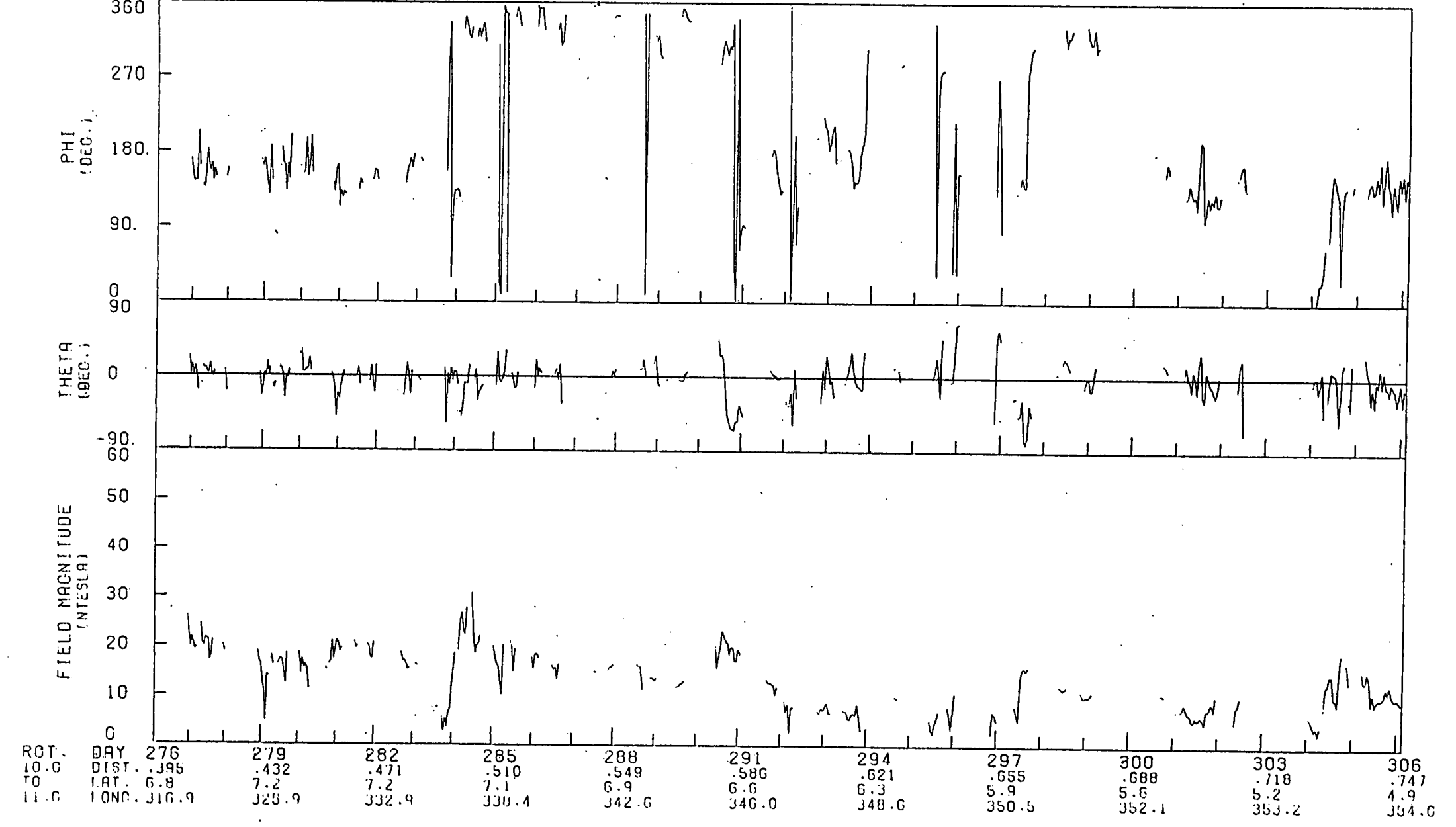

HELIOS. 1 EXP 3 (HOURLY AVERAGES) YEAR 1975
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
130
133
136
139
142
145
148
151
154
DIST
858
877
894
910
924
937
948
958
966

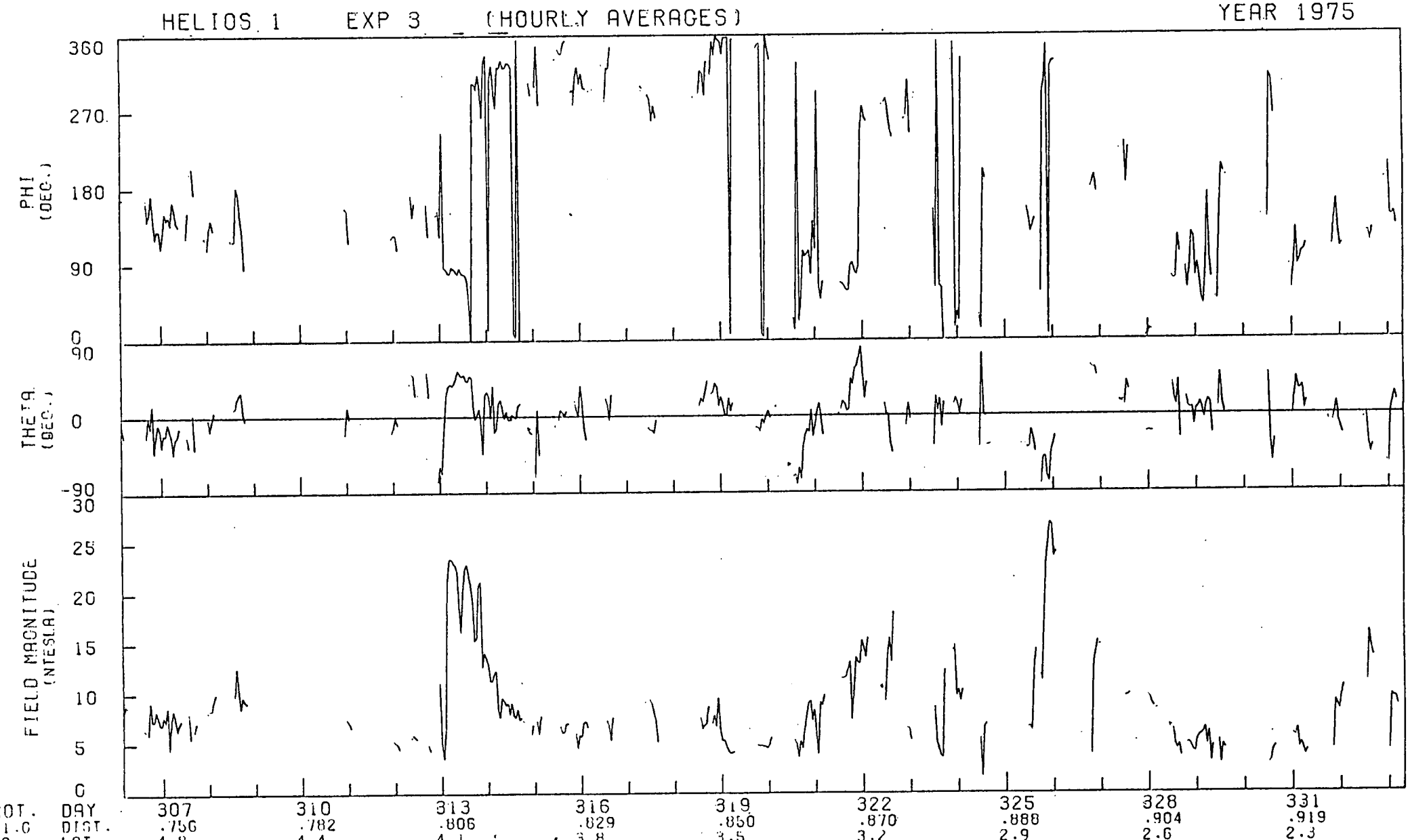

HELIOS 1 EXP 5 (HOURLY AVERAGES) YEAR 1975
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY 157 160 163 166 169 172 175 178 181
C.C DIST. .972 .978 .981 .984 .985 .984 .982 .979 .974
TC LAT. .8 .5 .3 .0 -.3 -.5 -.8 -1.1 -1.3
7.0 LONG. 174.4 173.7 172.9 172.1 171.4 170.6 169.8 169.1 168.4

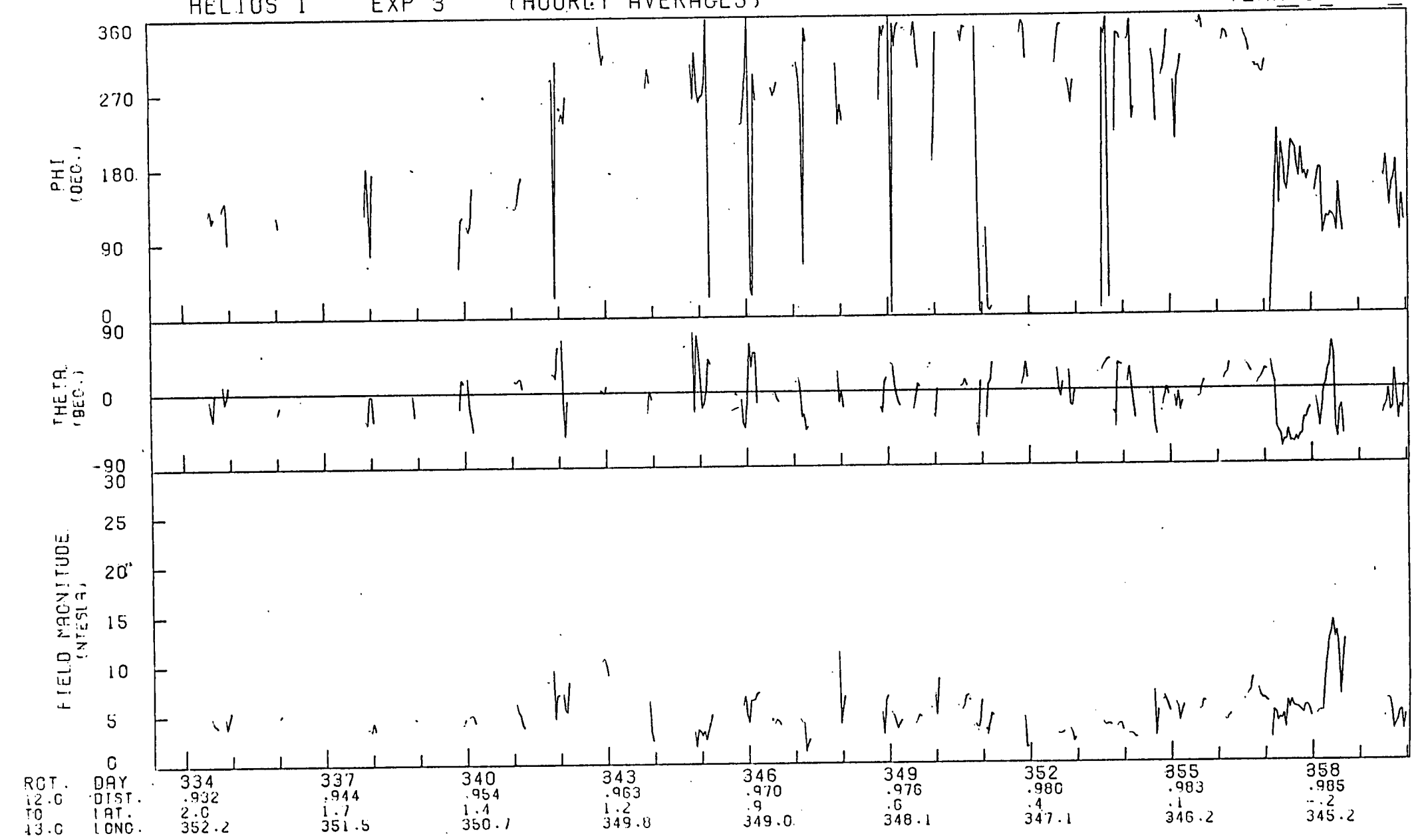

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1975
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 7.0
DAY DIST.
184 .968
187 .960
190 .951
193 .940
196 .928
199 .914
202 .899
205 .882
208 .864

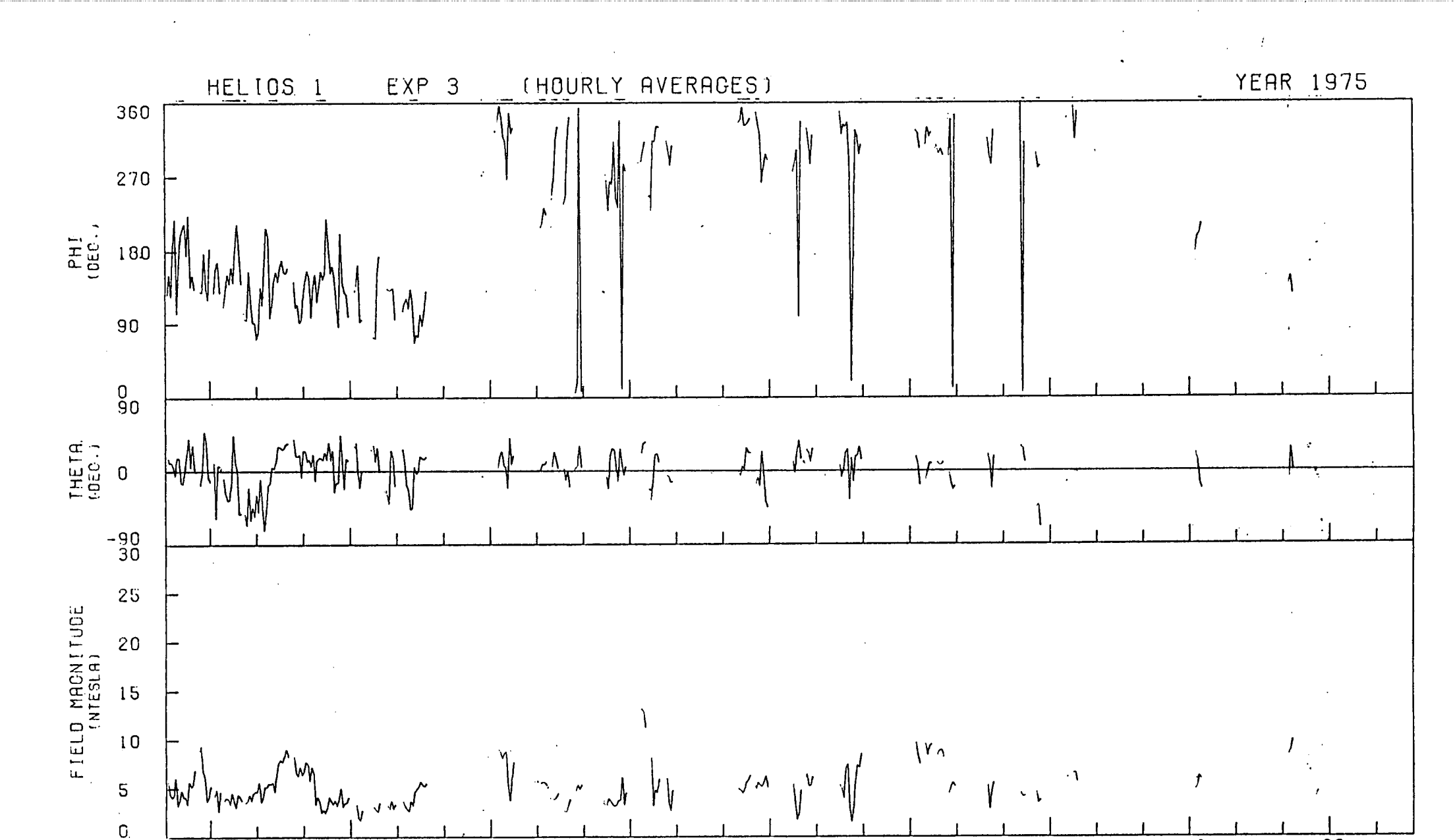

HELIOS 1 EXP 3 (HOURLY AVERAGES)
YEAR 1975
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY 210 213 216 219 222 225 228 231 234 237
R.O DIST. .851 .829 .807 .782 .756 .728 .698 .667 .633 .598
TO LAT. -4.0 -4.3 -4.6 -4.9 -5.2 -5.5 -5.8 -6.1 -6.4 -6.7
9.0 LONG. 163.8 163.8 163.9 164.3 164.8 165.6 166.7 168.2 170.1 172.6

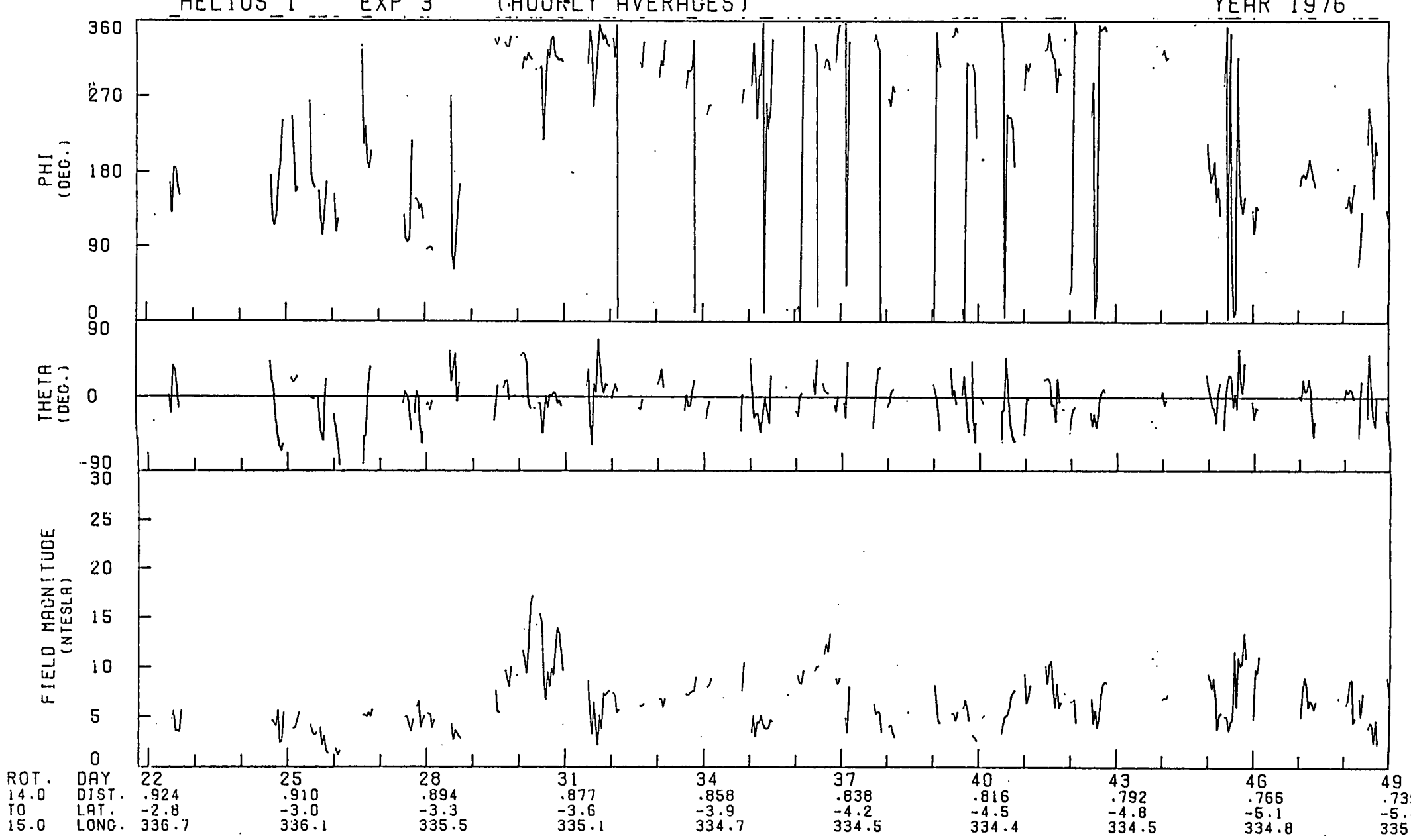

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1975
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY 238 241 244 247 250 253 256 259 262 265 268 271 274
9.0 DIST. .506 .549 .511 .472 .433 .395 .361 .332 .314 .310 .319 .341 .371

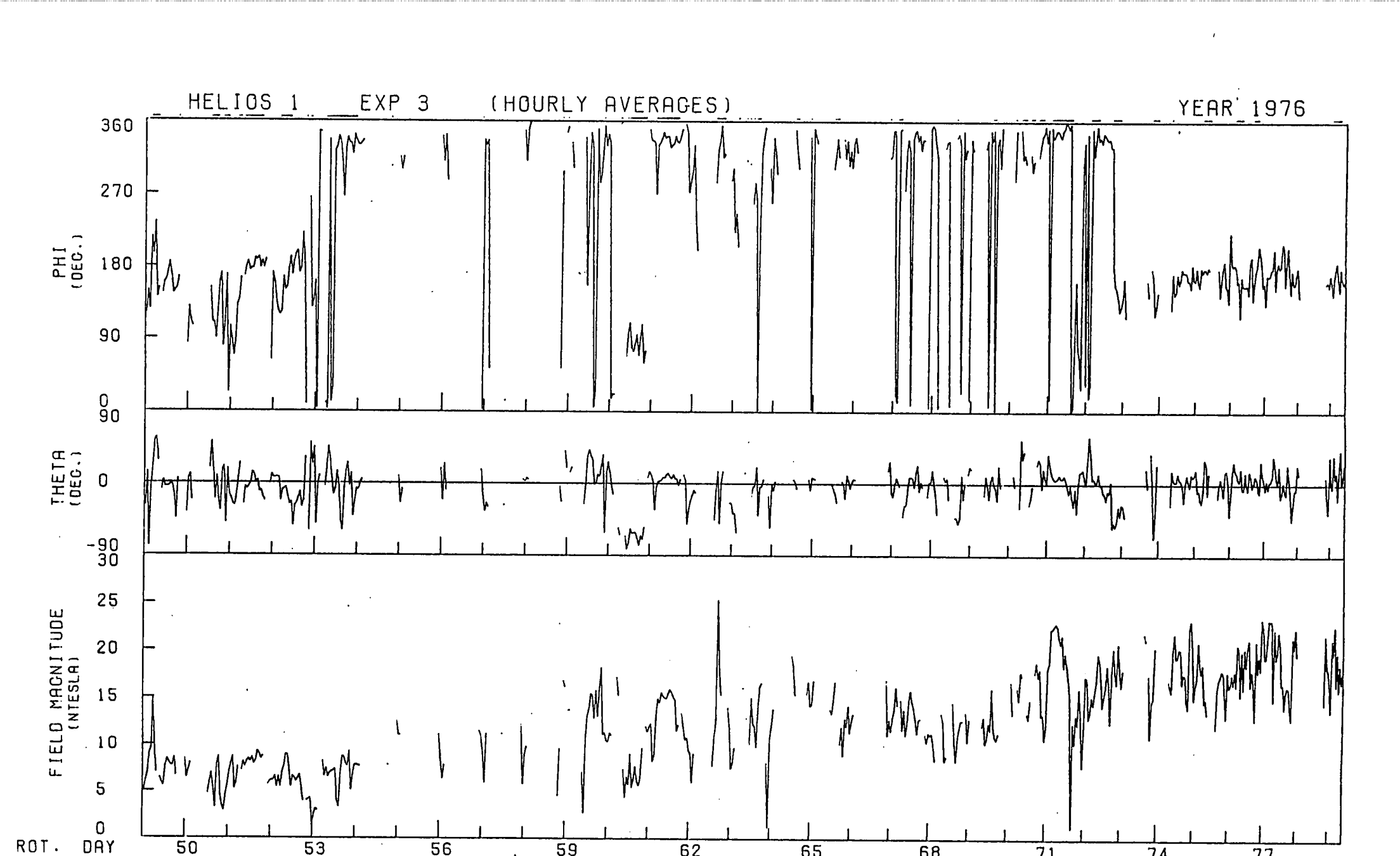

PHI
(DEG.)
360
270
180.
90.
0
THETA
(DEG.)
90
0
-90.
FIELD MAGNITUDE
(NTESLA)
60
50
40
30
20
10
0
ROT. DAY 276 279 282 285 288 291 294 297 300 303 306
10.0 DIST. .395 .432 .471 .510 .549 .586 .621 .655 .688 .718 .747
TO LAT. 6.8 7.2 7.2 7.1 6.9 6.6 6.3 5.9 5.6 5.2 4.9
11.0 LONG. 316.9 325.9 332.9 338.4 342.6 346.0 348.6 350.5 352.1 353.2 354.0

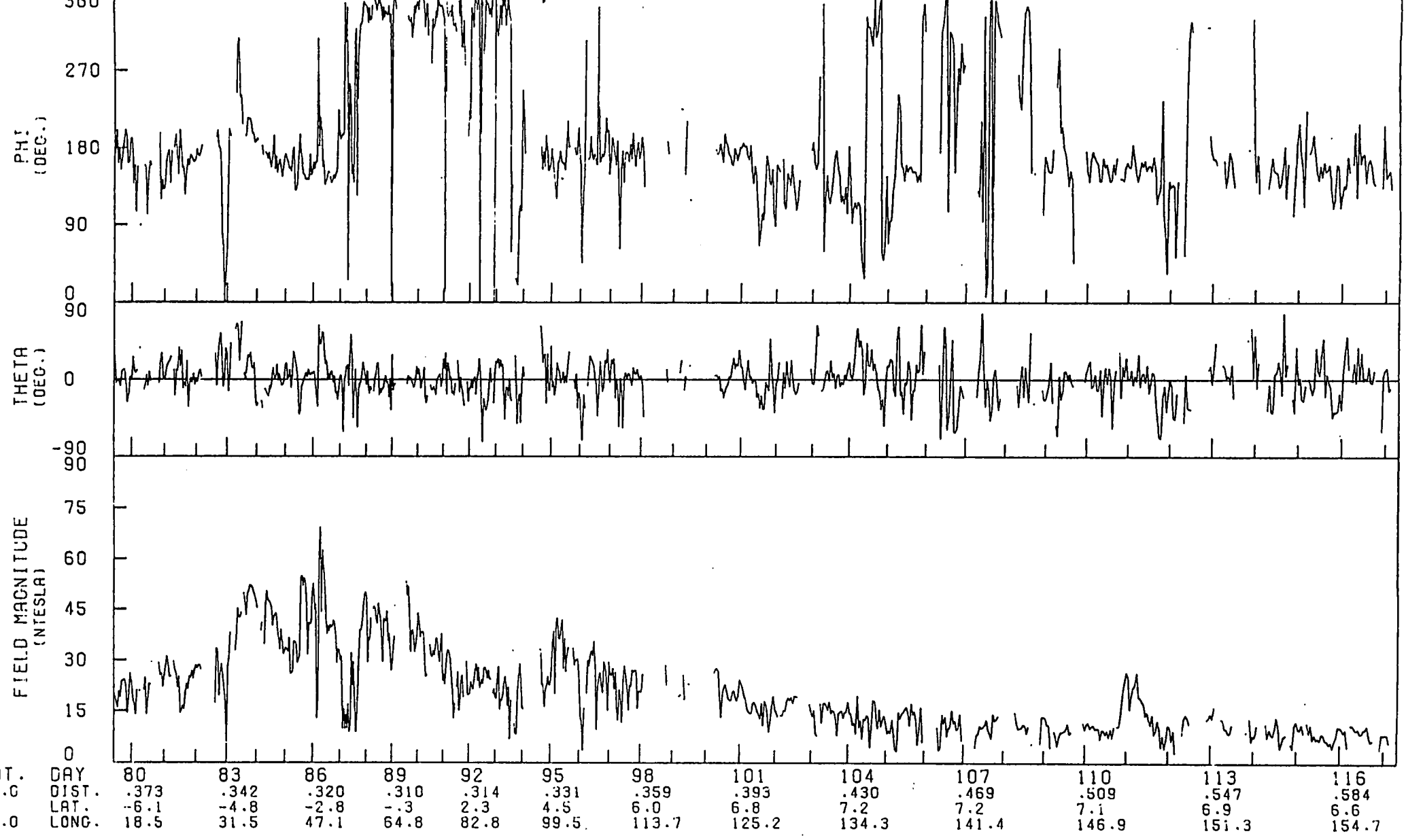

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1975
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
11.6 DIST.
307 .756
310 .782
313 .806
316 .829
319 .850
322 .870
325 .888
328 .904
331 .919
2.9
2.6
2.3


HELIOS 1 EXP 3 (HOURLY AVERAGES)
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
12.0 DIST.
TO LAT.
13.0 LONG.
334 .932 2.0 352.2
337 .944 1.7 351.5
340 .954 1.4 350.1
343 .963 1.2 349.8
346 .970 .9 349.0
349 .976 .6 348.1
352 .980 .4 347.1
355 .983 .1 346.2
358 .985 -.2 345.2

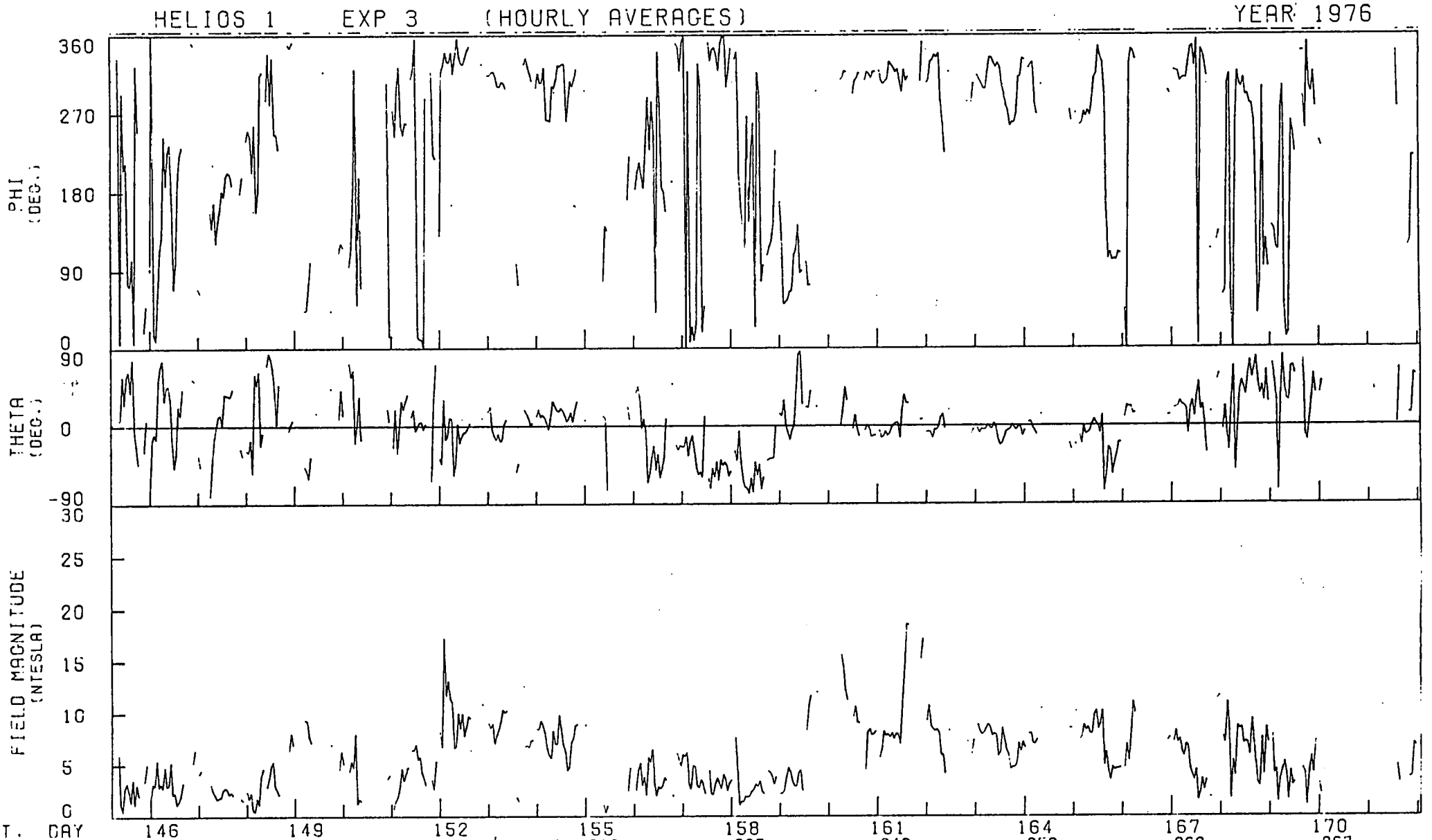

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1975
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY 361 364 2 5 8 11 14 17 20
13.0 DIST. .985 .983 .980 .976 .970 .963 .955 .945 .933
TO LAT. -.4 -.7 -1.0 -1.2 -1.5 -1.8 -2.0 -2.3 -2.6
14.0 LONG 344.3 343.3 342.3 341.4 340.5 339.6 338.8 337.9 337.2

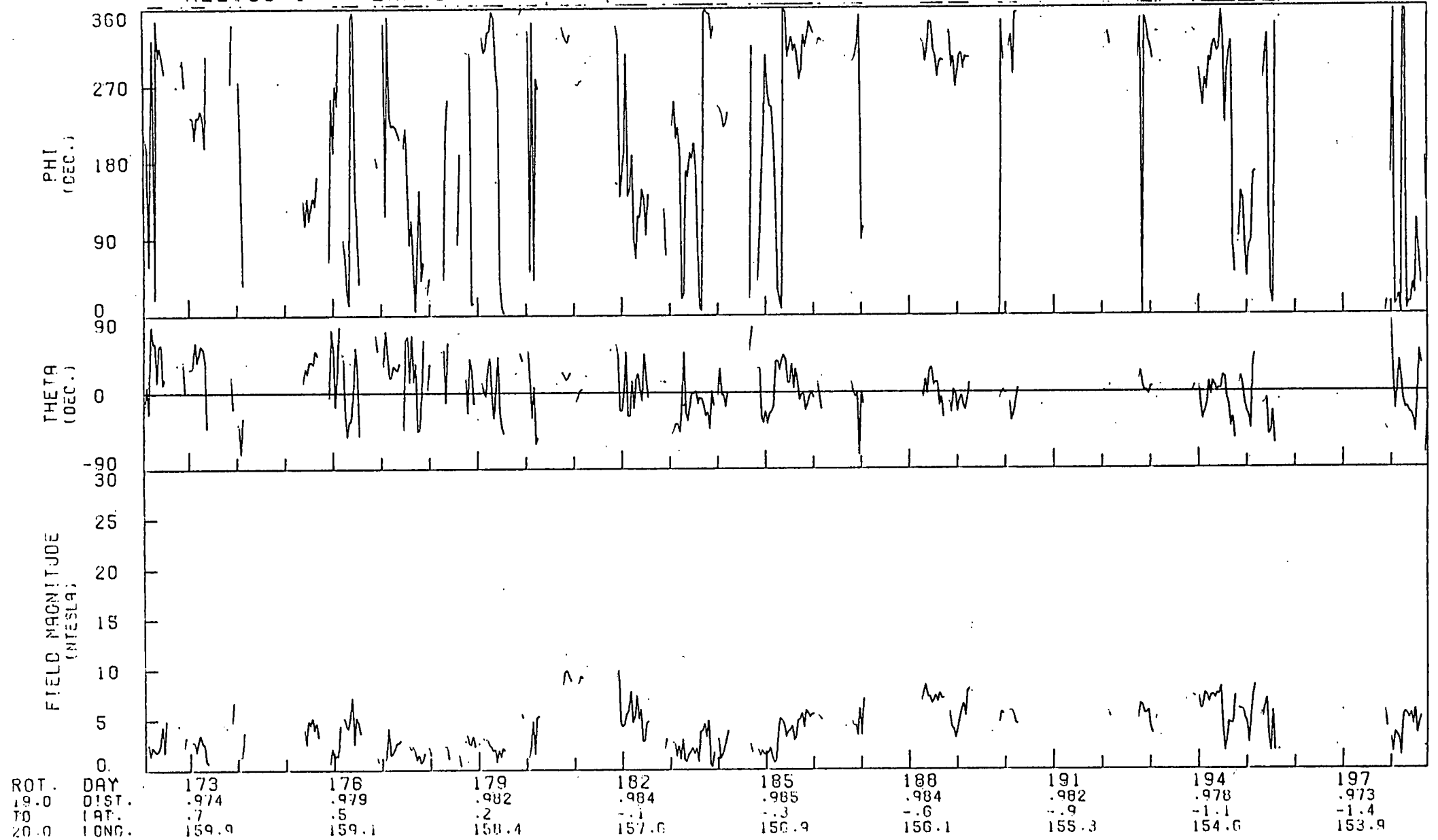

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY 22 25 28 31 34 37 40 43 46 49
14.0 DIST. .924 .910 .894 .877 .858 .838 .816 .792 .766 .739
TO LAT. -2.8 -3.0 -3.3 -3.6 -3.9 -4.2 -4.5 -4.8 -5.1 -5.4
15.0 LONG. 336.7 336.1 335.5 335.1 334.7 334.5 334.4 334.5 334.8 335.4

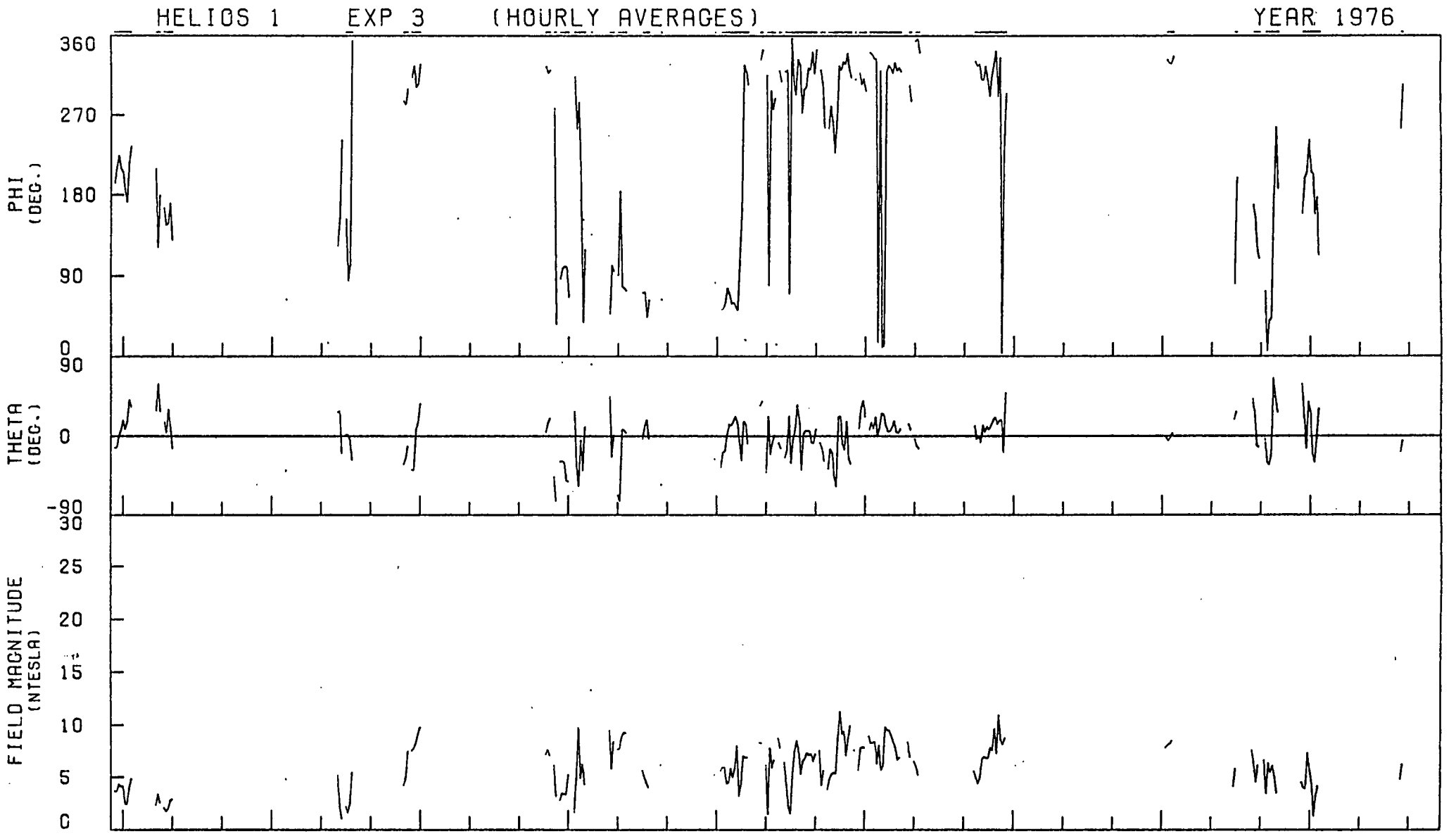

HELIOS 1 EXP 3 (HOURLY AVERAGES)
YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
50
53
56
59
62
65
68
71
74
77

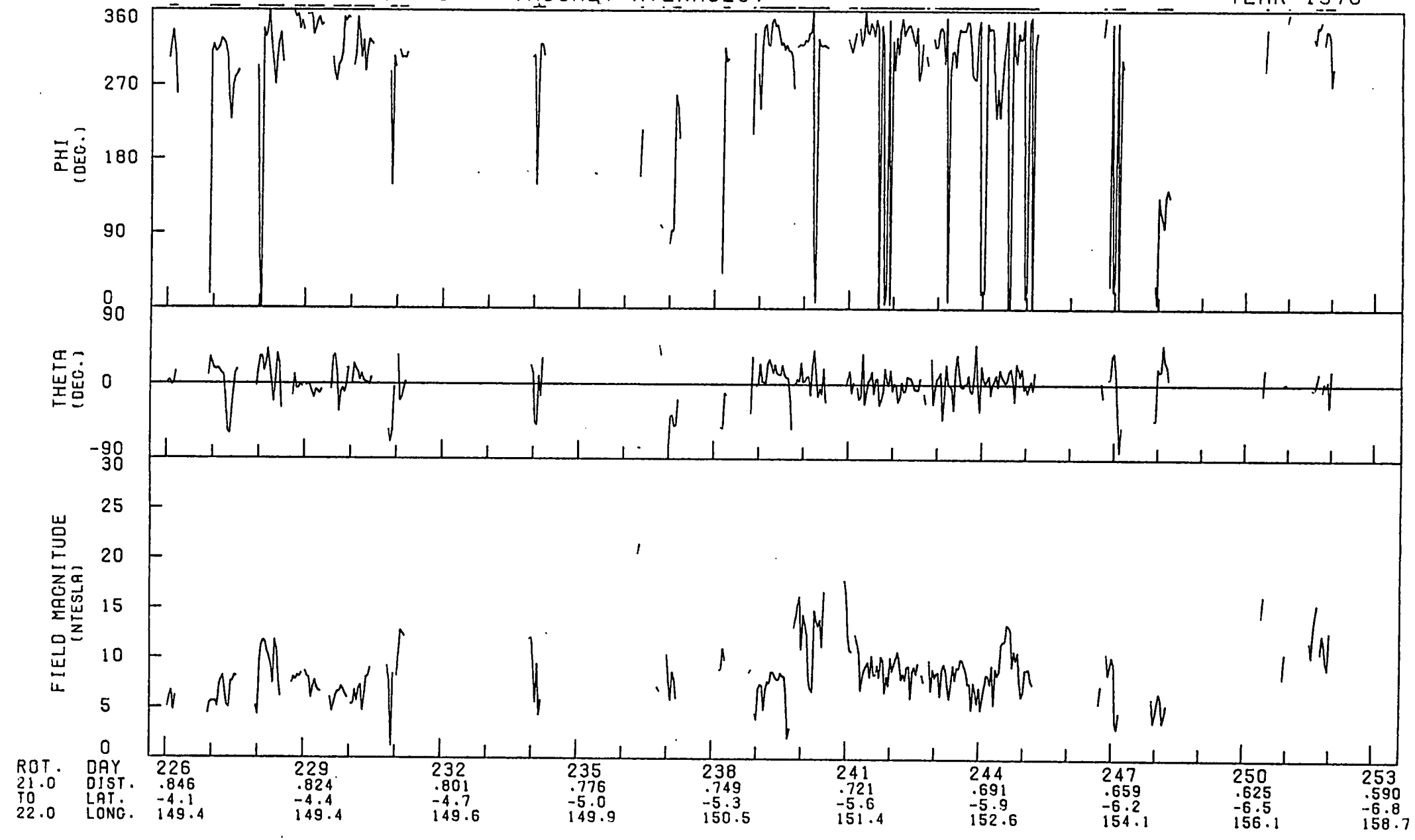


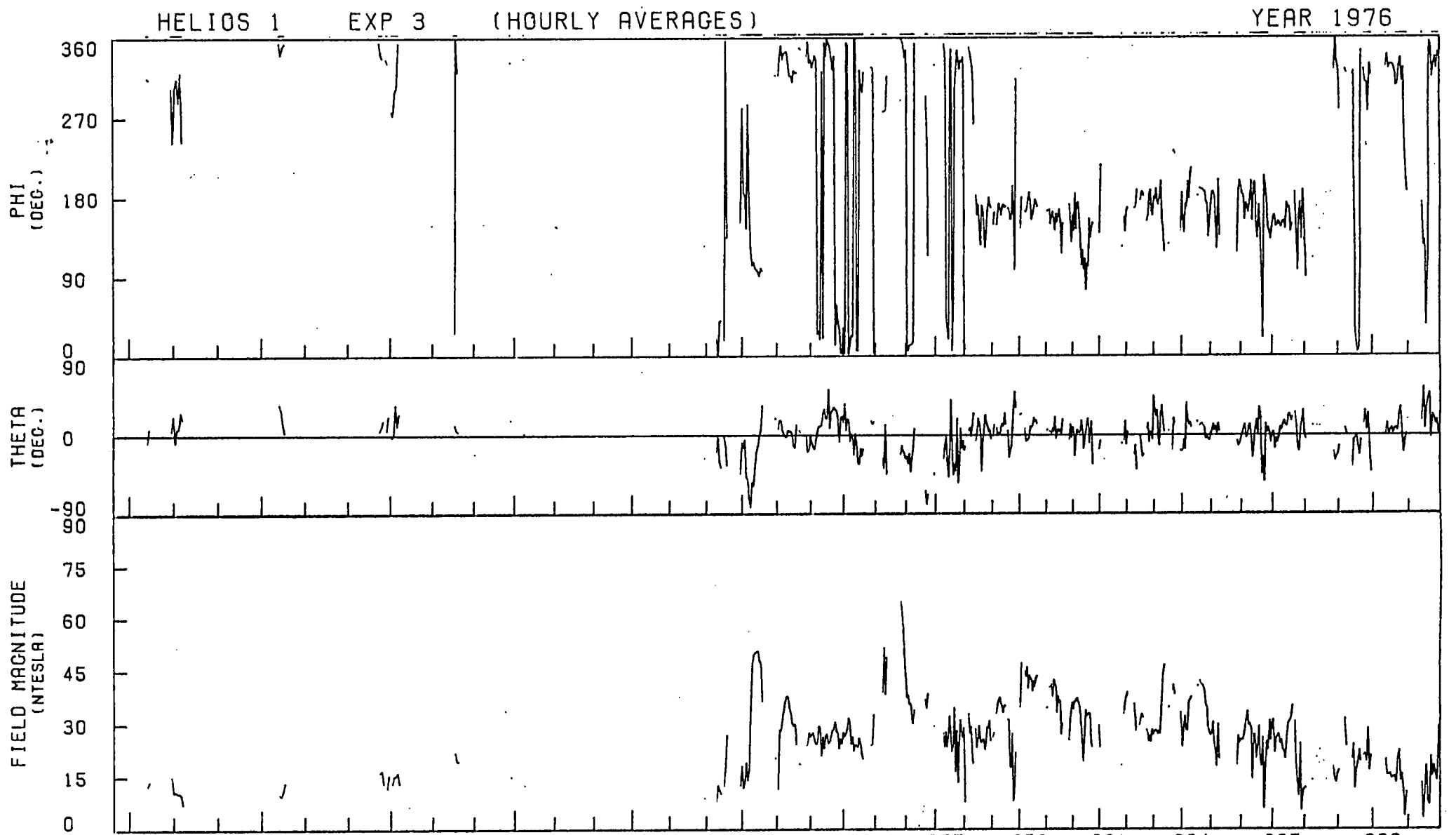
ROT.	DAY	80	83	86	89	92	95	98	101	104	107	110	113	116
16.0	DIST.	.373	.342	.320	.310	.314	.331	.359	.393	.430	.469	.509	.547	.584
TO	LAT.	-6.1	-4.8	-2.8	-.3	2.3	4.5	6.0	6.8	7.2	7.2	7.1	6.9	6.6
17.0	LONG.	18.5	31.5	47.1	64.8	82.8	99.5	113.7	125.2	134.3	141.4	146.9	151.3	154.7

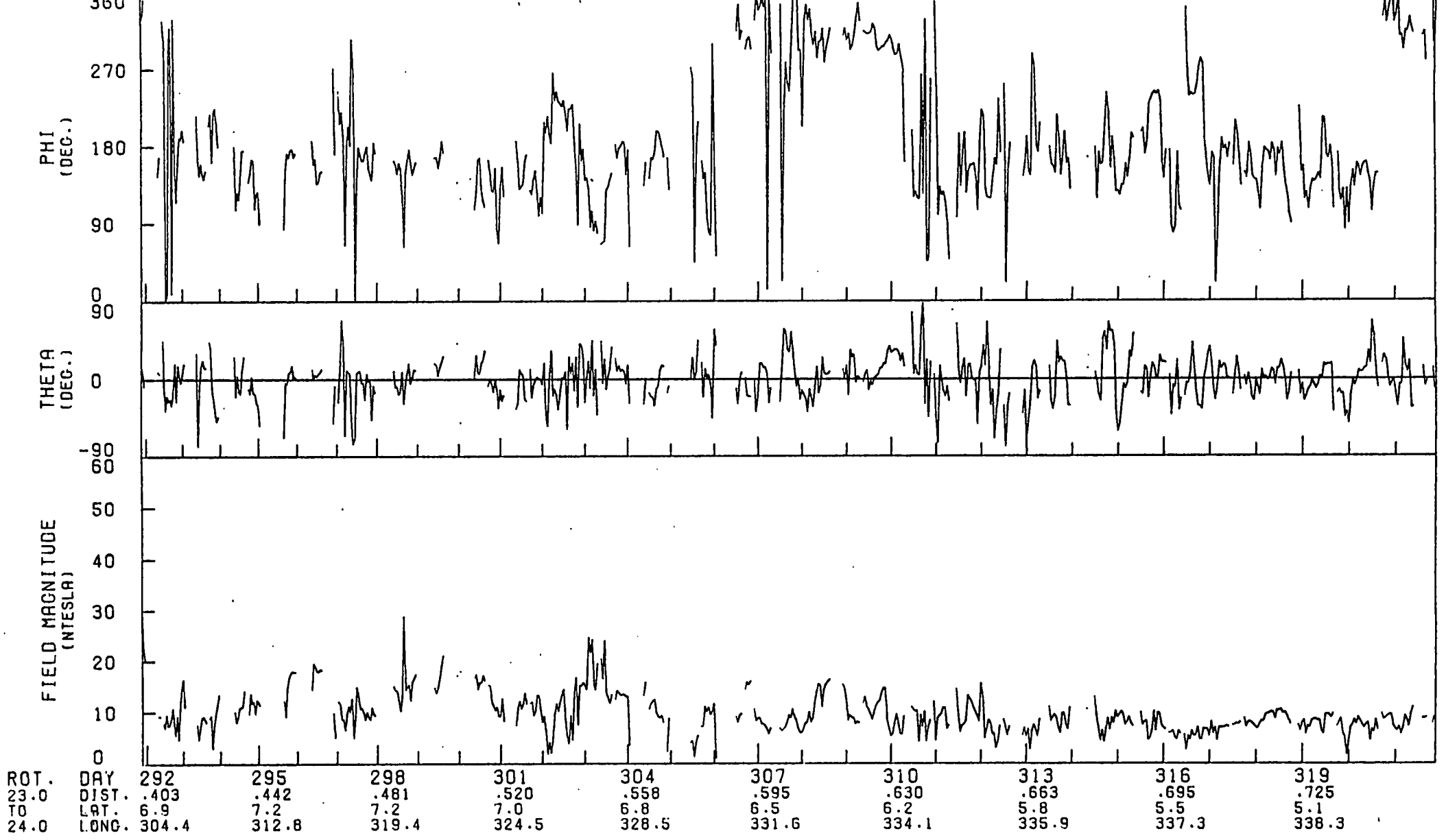

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
146
149
152
155
158
161
164
167
170


PHI (DEC.)
360
270
180
90
0
THETA (DEC.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0.
ROT.
-19.0
TO
20.0
DAY
DIST.
LAT.
LONG.
173
.974
.7
159.9
176
.979
.5
159.1
179
.982
.2
158.4
182
.984
-.1
157.6
185
.985
-.3
156.9
188
.984
-.6
156.1
191
.982
-.9
155.3
194
.978
-1.1
154.6
197
.973
-1.4
153.9

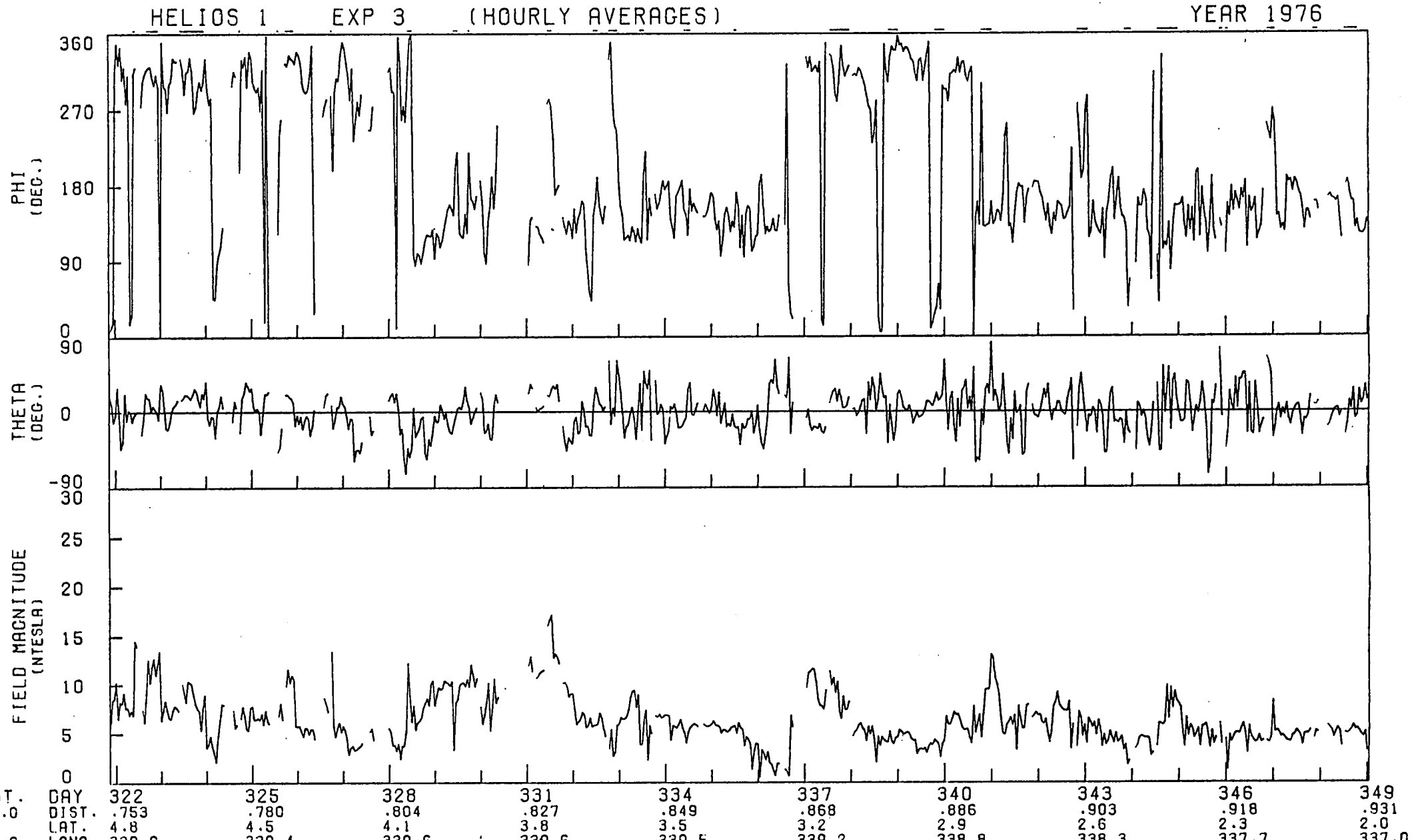

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
20.0 DIST.
199 .968
202 .961
205 .952
208 .941
211 .929
214 .916
217 .901
220 .884
223 .866

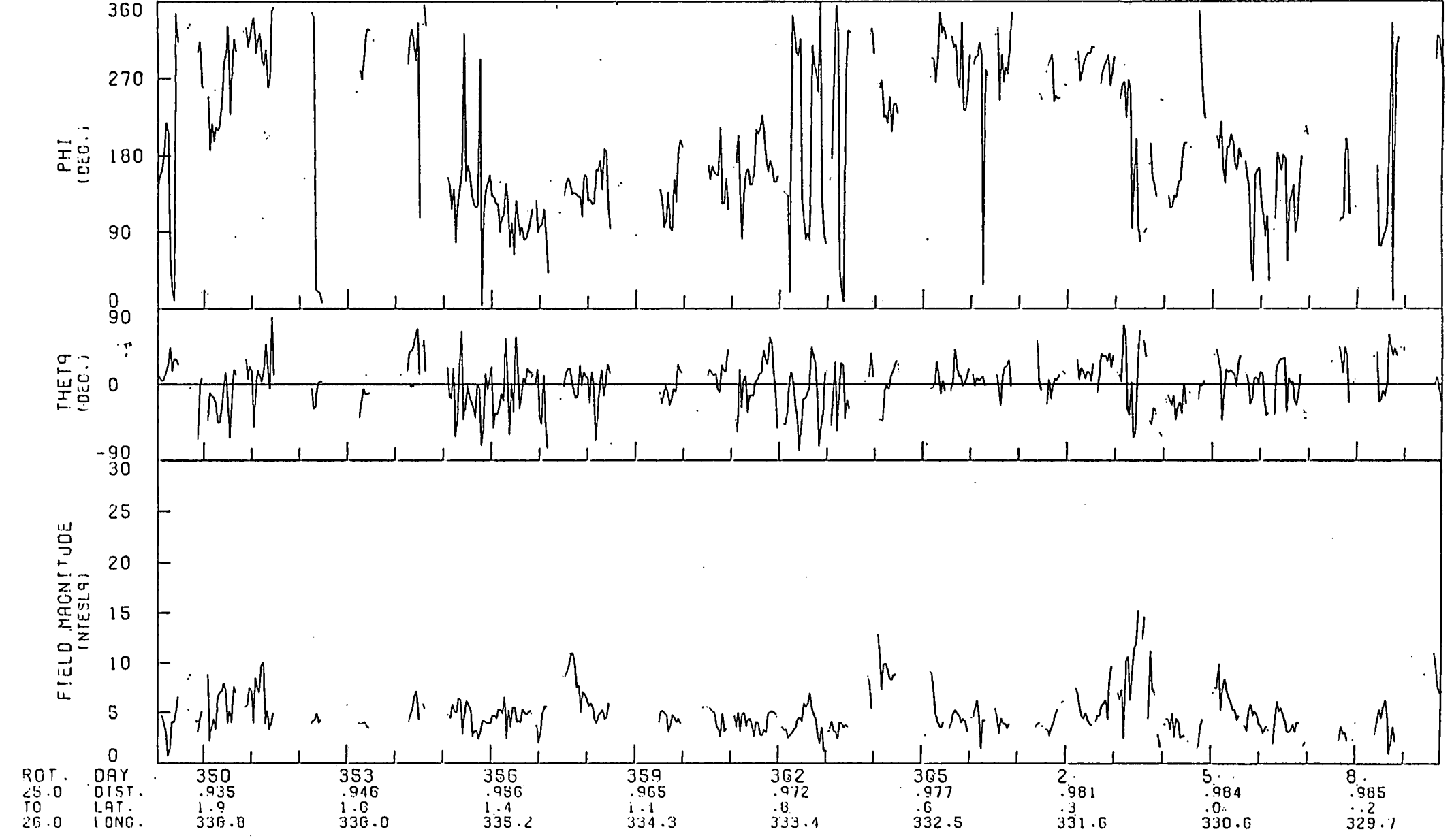

PHI (DEC.)
360
270
180
90
0
THETA (DEC.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 21.0 TO 22.0
DAY 226 229 232 235 238 241 244 247 250 253
DIST. .846 .824 .801 .776 .749 .721 .691 .659 .625 .590
LAT. -4.1 -4.4 -4.7 -5.0 -5.3 -5.6 -5.9 -6.2 -6.5 -6.8
LONG. 149.4 149.4 149.6 149.9 150.5 151.4 152.6 154.1 156.1 158.7

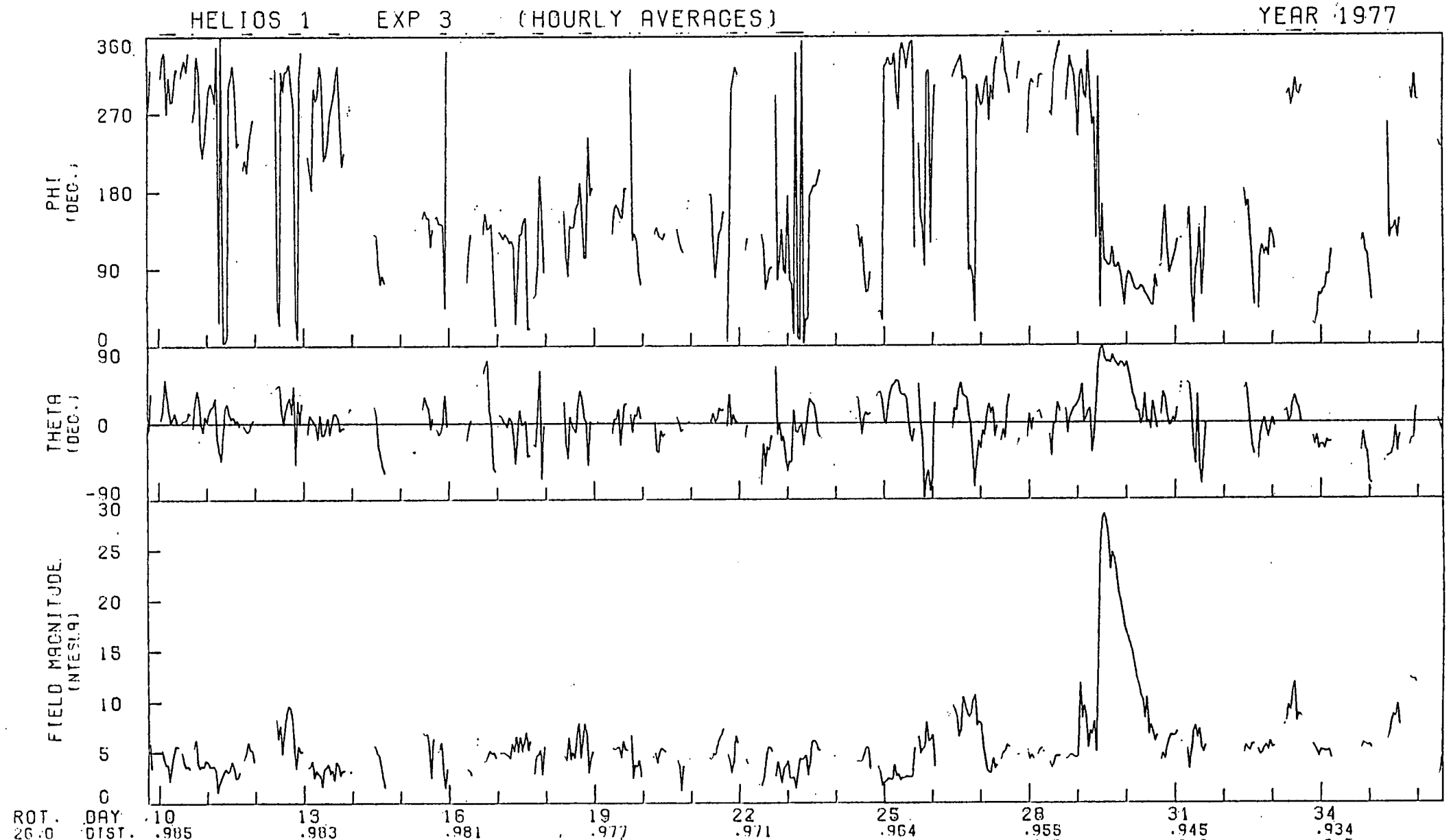

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
90
75
60
45
30
15
0
ROT. DAY
22.0 DIST.
254 .577
257 .540
260 .502
263 .462
266 .423
269 .386
272 .353
275 .327
278 .312
281 .311
284 .323
287 .347
290 .379

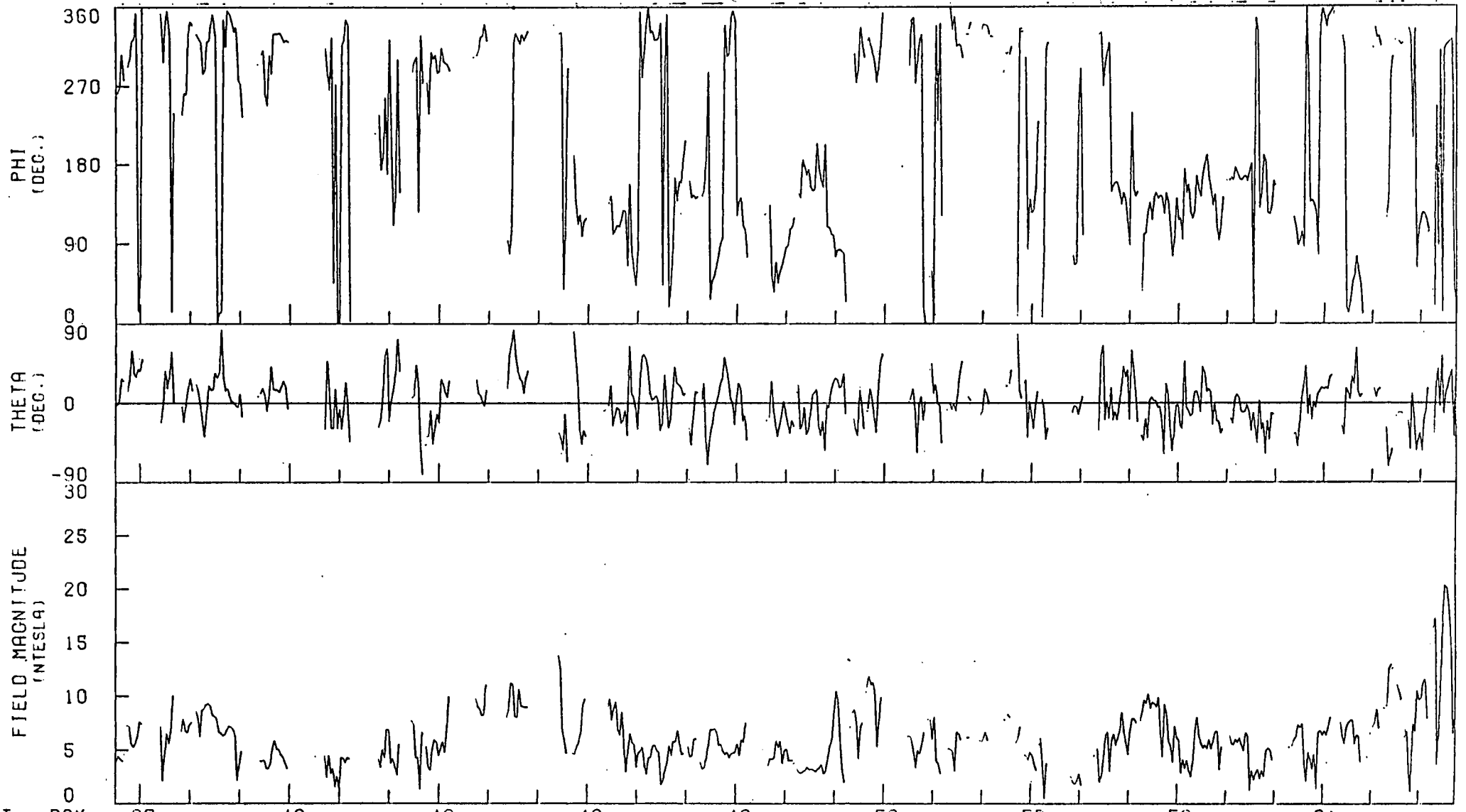


ROT.	DAY	292	295	298	301	304	307	310	313	316	319
23.0	DIST.	.403	.442	.481	.520	.558	.595	.630	.663	.695	.725
TO	LAT.	6.9	7.2	7.2	7.0	6.8	6.5	6.2	5.8	5.5	5.1
24.0	LONG.	304.4	312.8	319.4	324.5	328.5	331.6	334.1	335.9	337.3	338.3

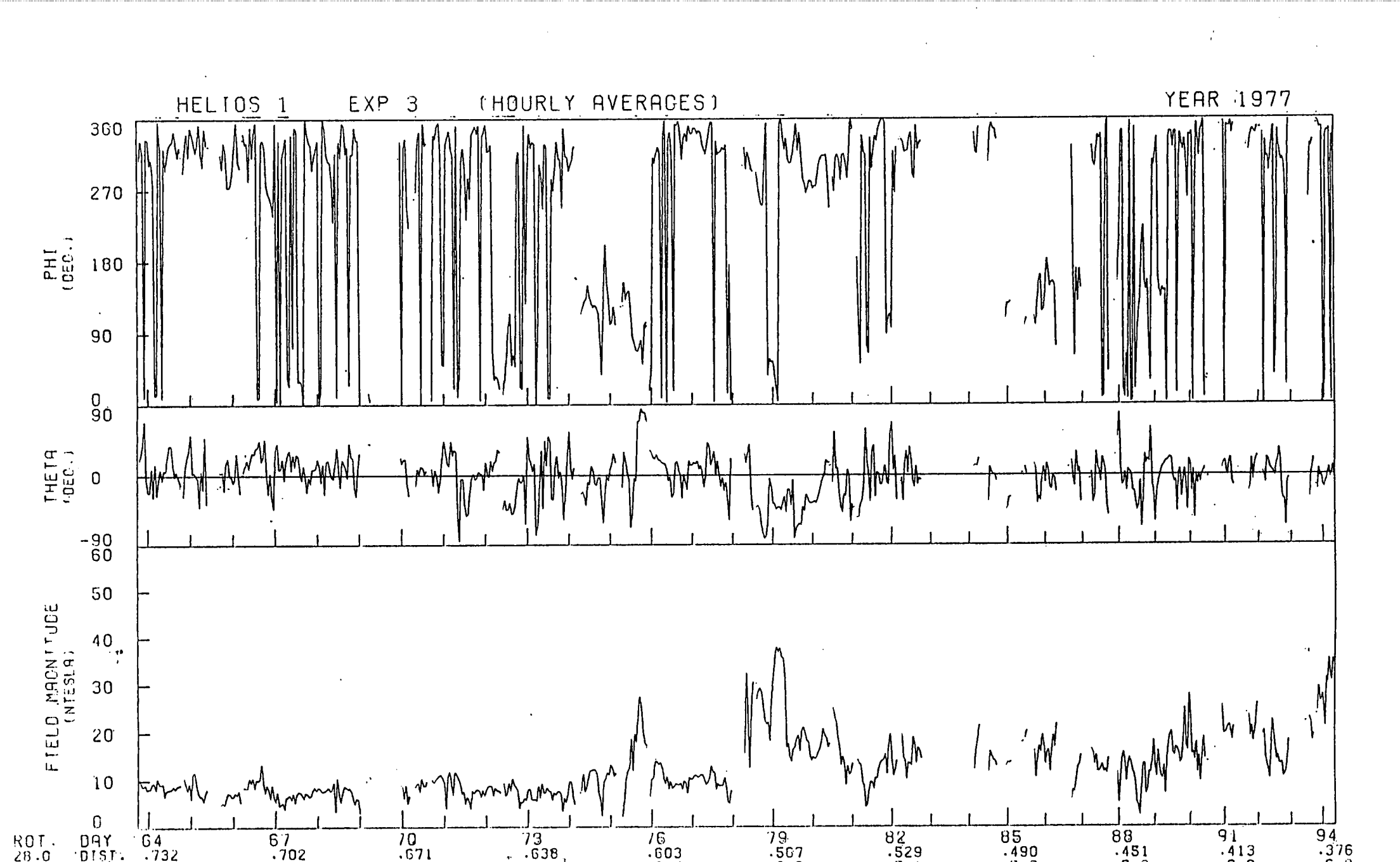

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY 322 325 328 331 334 337 340 343 346 349
24.0 DIST. .753 .780 .804 .827 .849 .868 .886 .903 .918 .931
TO LAT. 4.8 4.5 4.1 3.8 3.5 3.2 2.9 2.6 2.3 2.0

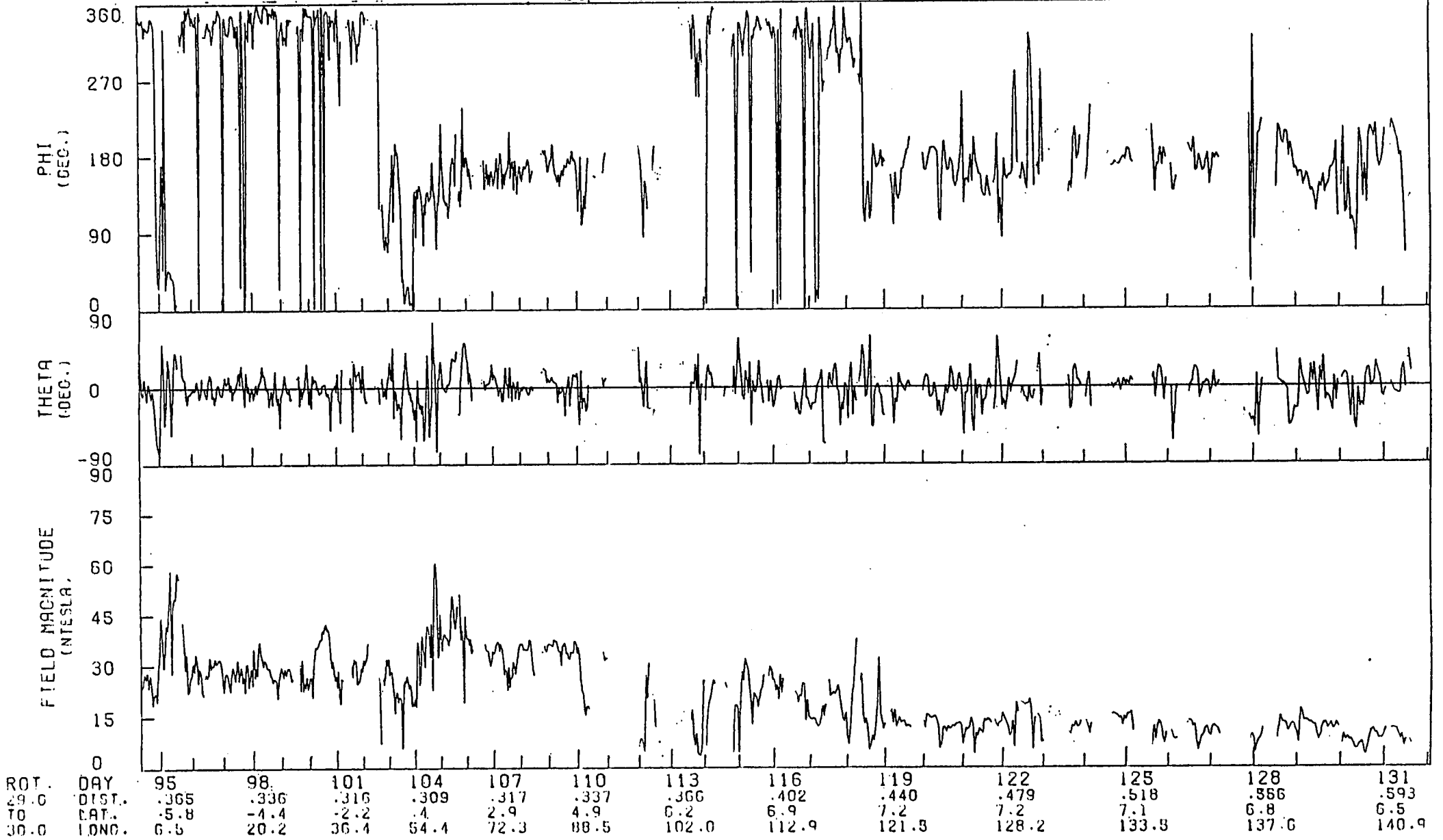

PHI
(DEG.)
360
270
180
90
0
THETA
(DEG.)
90
0
-90
FIELD MAGNITUDE
(NTESLA)
30
25
20
15
10
5
0
ROT. DAY 350 353 356 359 362 365 2 5 8
25.0 DIST. .935 .946 .956 .965 .972 .977 .981 .984 .985
TO LAT. 1.9 1.6 1.4 1.1 .8 .6 .3 .0 -.2
26.0 LONG. 336.8 336.0 335.2 334.3 333.4 332.5 331.6 330.6 329.7


HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1977
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
26.0 DIST.
10 .985
13 .983
16 .981
19 .977
22 .971
25 .964
28 .955
31 .945
34 .934

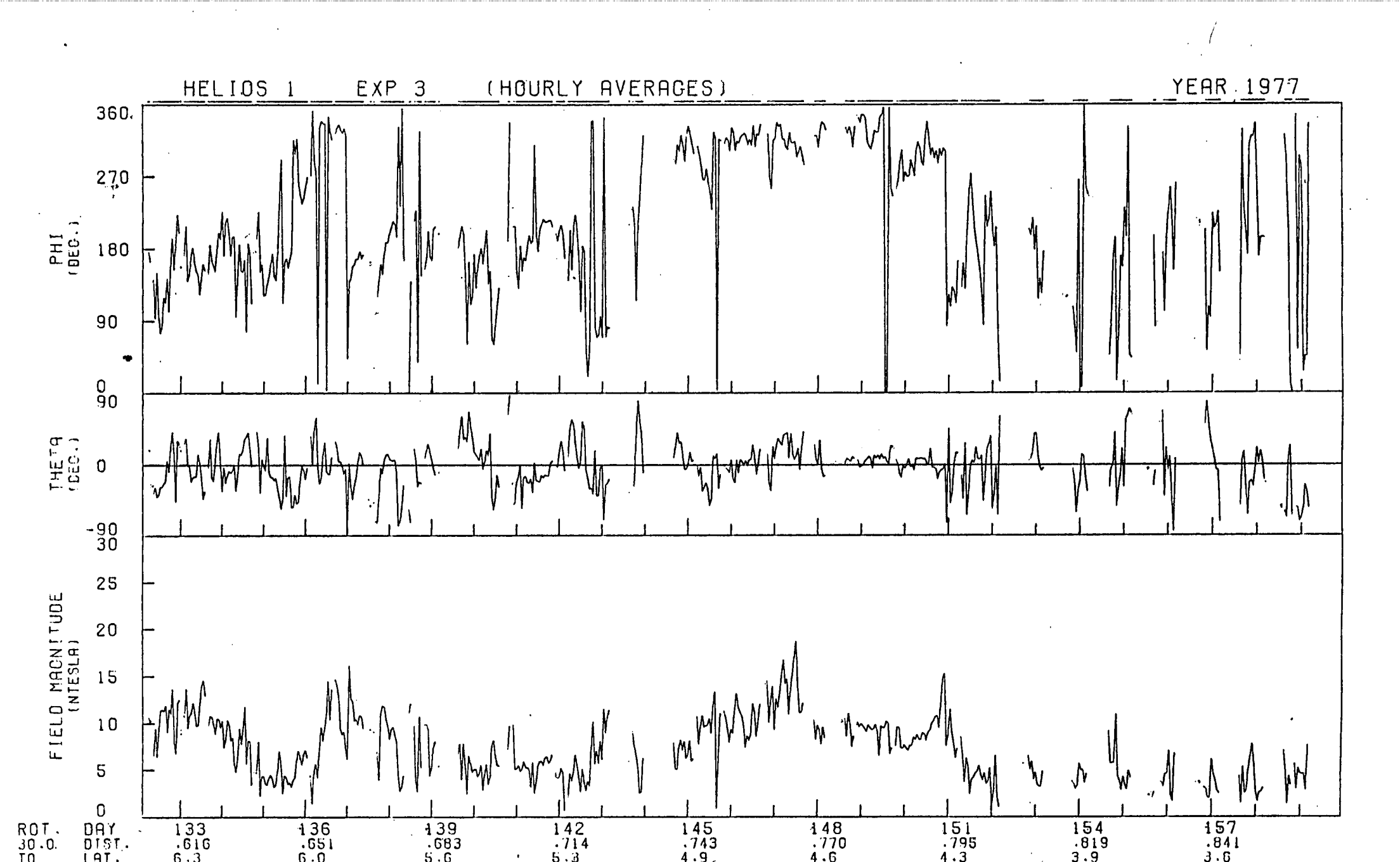


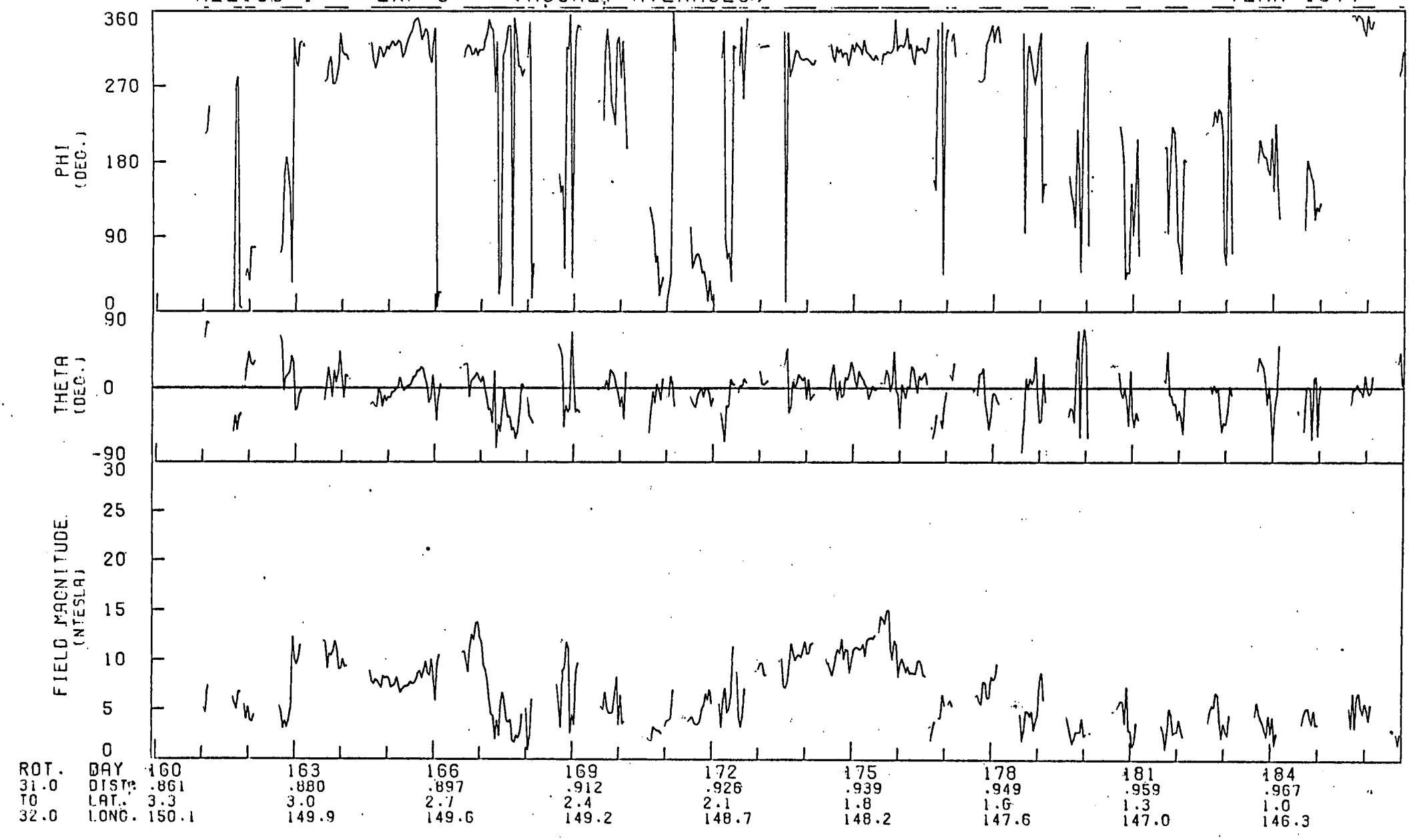
ROT.	DAY	37	40	43	46	49	52	55	58	61
27.0	DIST.	.921	.907	.890	.873	.853	.833	.810	.786	.760
TO	LAT.	-2.6	-3.1	-3.4	-3.7	-4.0	-4.3	-4.6	-4.9	-5.2
28.0	LONG.	321.3	320.7	320.2	319.8	319.4	319.3	319.3	319.4	319.8

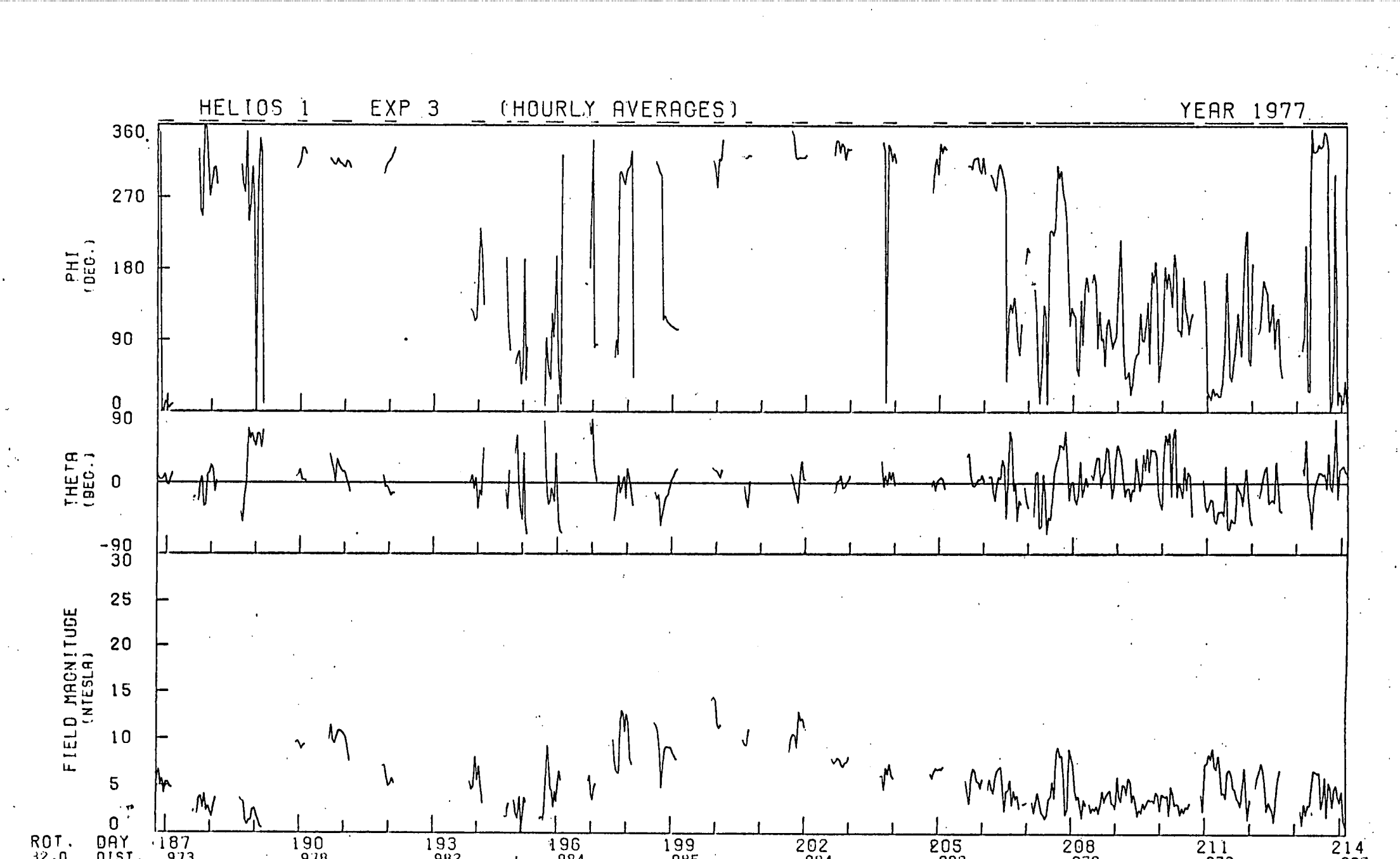

HELIOS 1 EXP 3 (HOURLY AVERAGES)
YEAR 1977
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. 28.0
DAY 64 67 70 73 76 79 82 85 88 91 94
DIST. .732 .702 .671 .638 .603 .567 .529 .490 .451 .413 .376

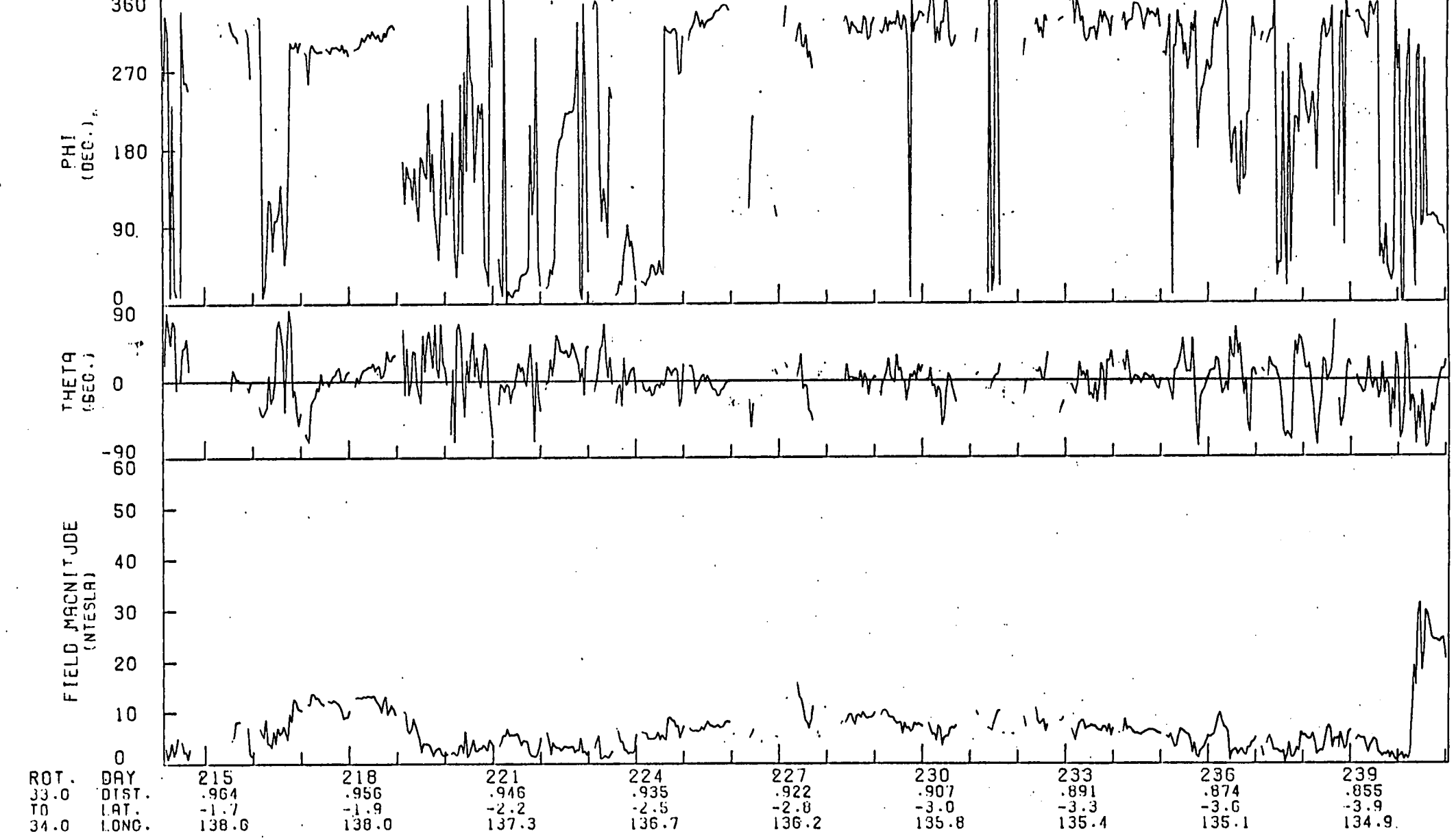


ROT.	DAY	95	98	101	104	107	110	113	116	119	122	125	128	131
29.6	DIST.	.365	.336	.316	.309	.317	.337	.366	.402	.440	.479	.518	.556	.593
TO	LAT.	-5.8	-4.4	-2.2	.4	2.9	4.9	6.2	6.9	7.2	7.2	7.1	6.8	6.5
30.0	LONG.	6.5	20.2	36.4	54.4	72.3	88.5	102.0	112.9	121.5	128.2	133.5	137.6	140.9

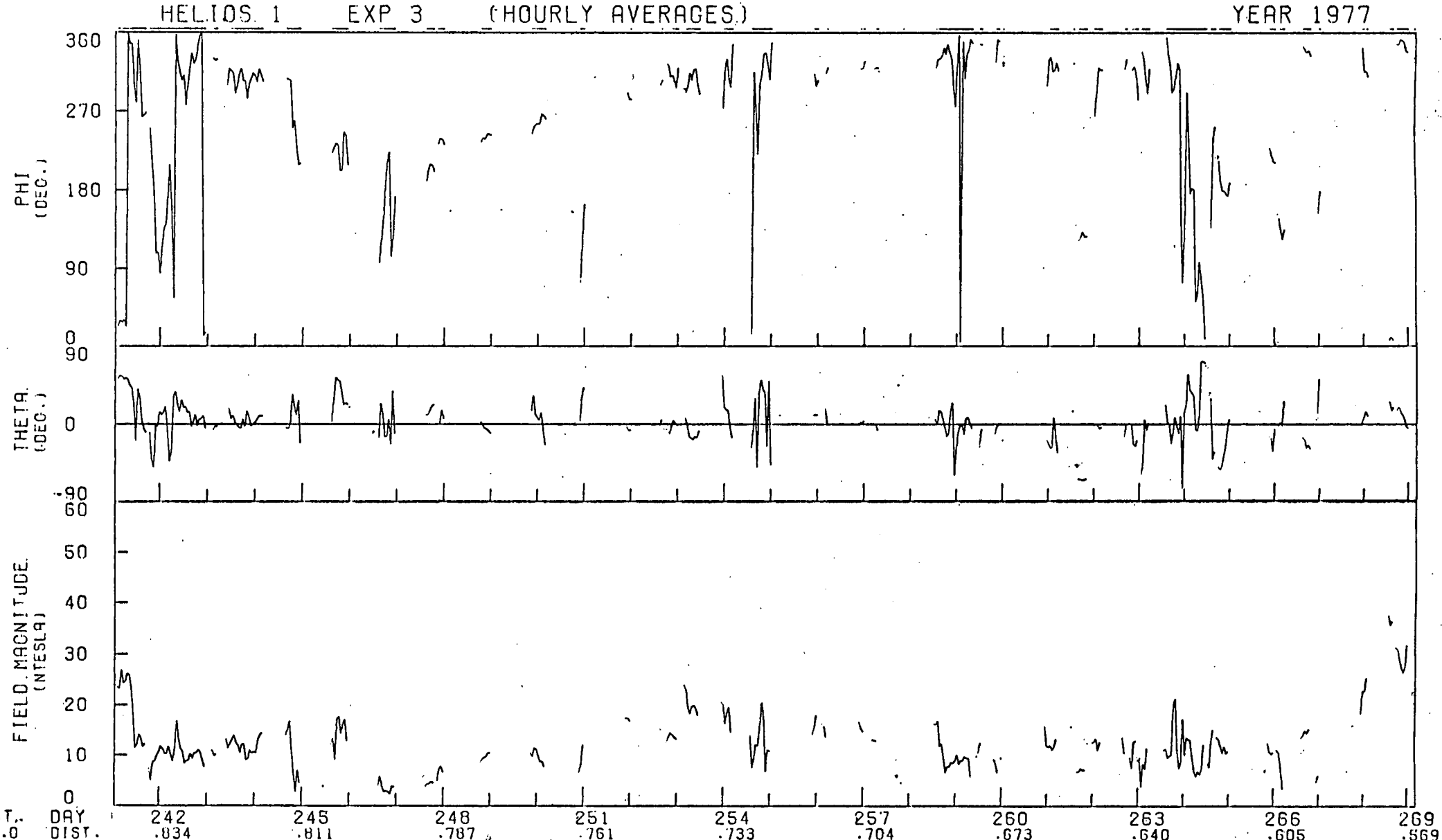

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1977
PHI (DEG.)
360.
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
30.0. DIST.
TO LAT.
133 .616 6.3
136 .651 6.0
139 .683 5.6
142 .714 5.3
145 .743 4.9
148 .770 4.6
151 .795 4.3
154 .819 3.9
157 .841 3.6

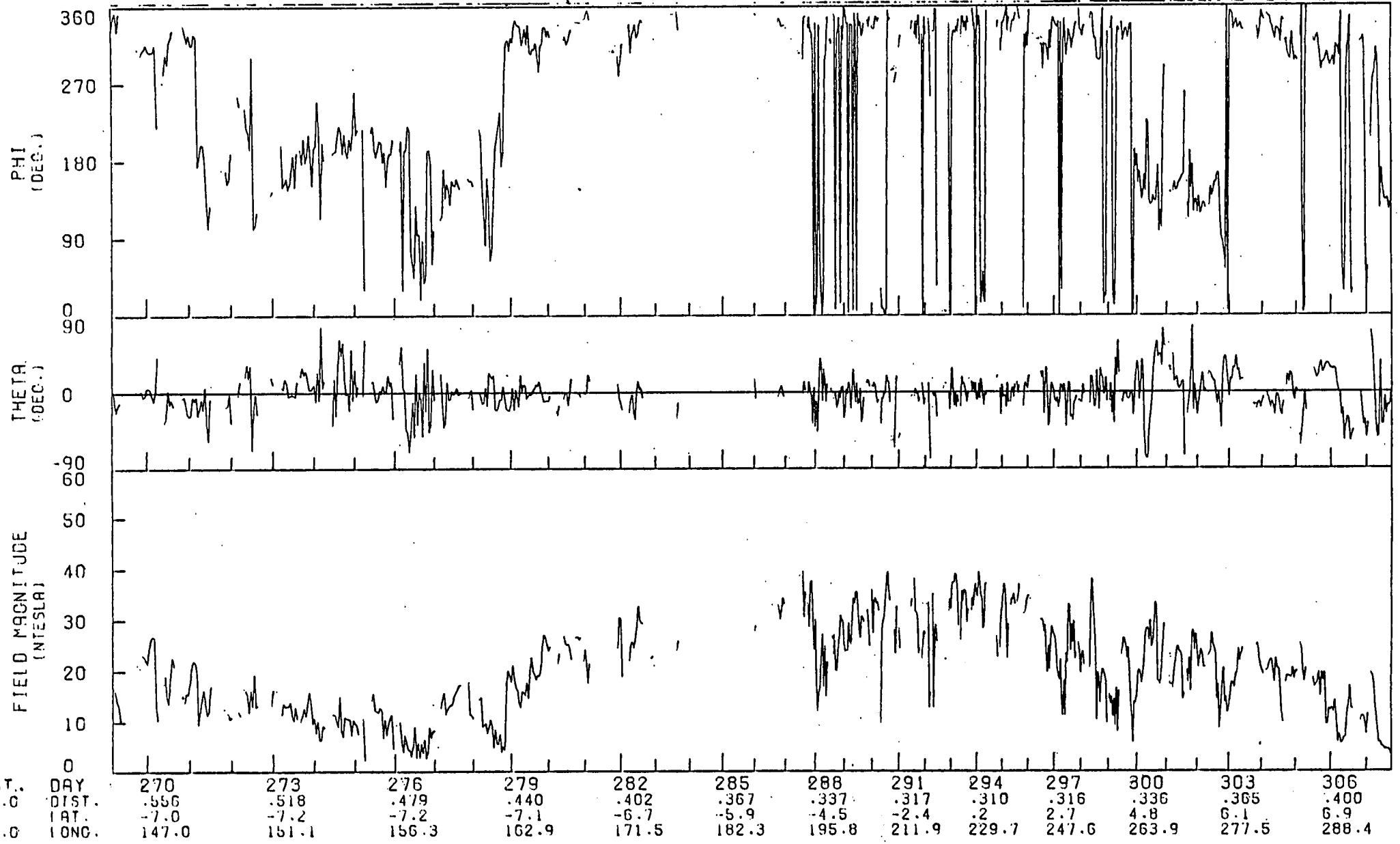

PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 31.0 TO 32.0
DAY 160 163 166 169 172 175 178 181 184
DIST. .861 .880 .897 .912 .926 .939 .949 .959 .967
LAT. 3.3 3.0 2.7 2.4 2.1 1.8 1.6 1.3 1.0
LONG. 150.1 149.9 149.6 149.2 148.7 148.2 147.6 147.0 146.3

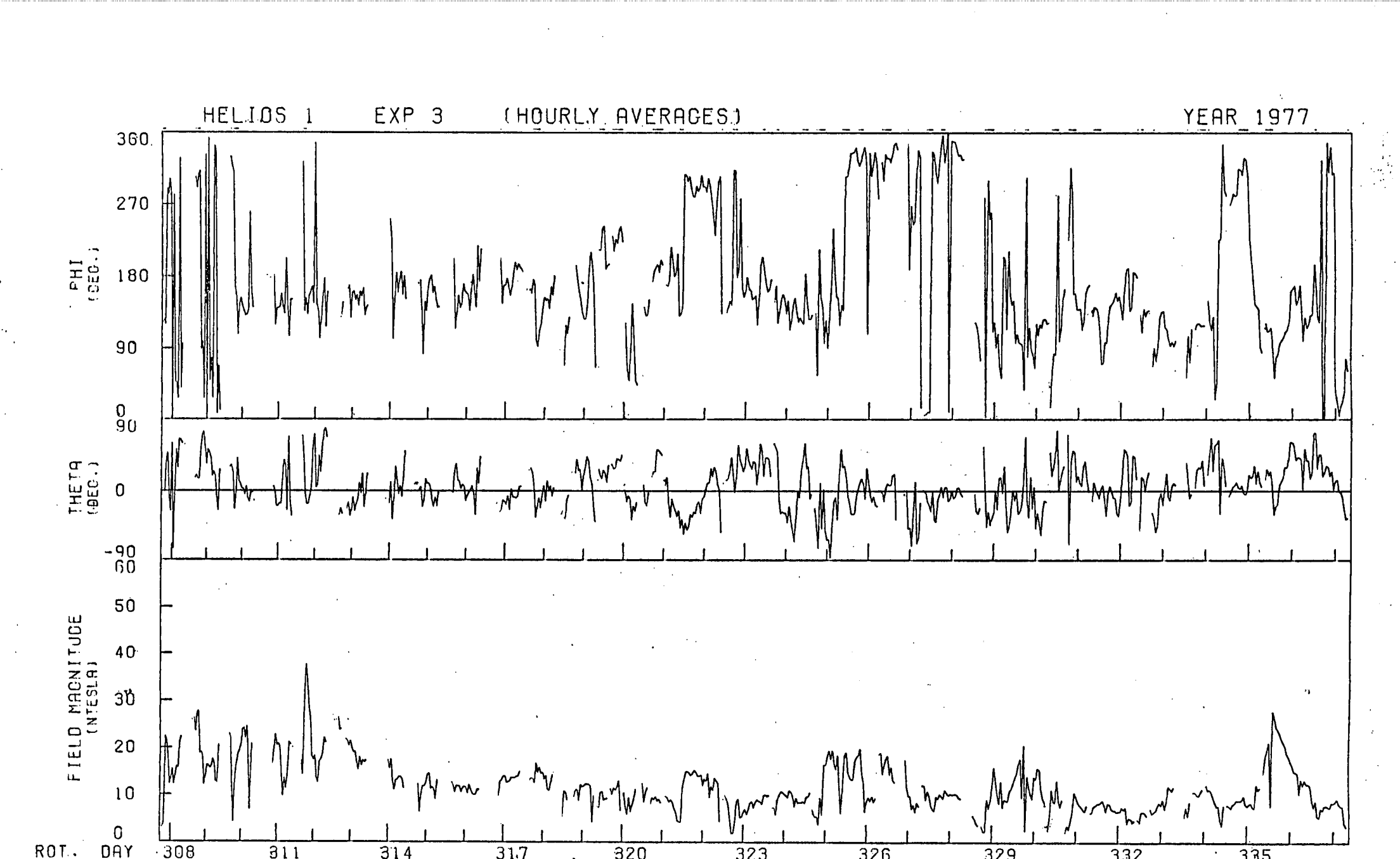

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1977
PHI (DEG.)
360.
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
187
190
193
196
199
202
205
208
211
214

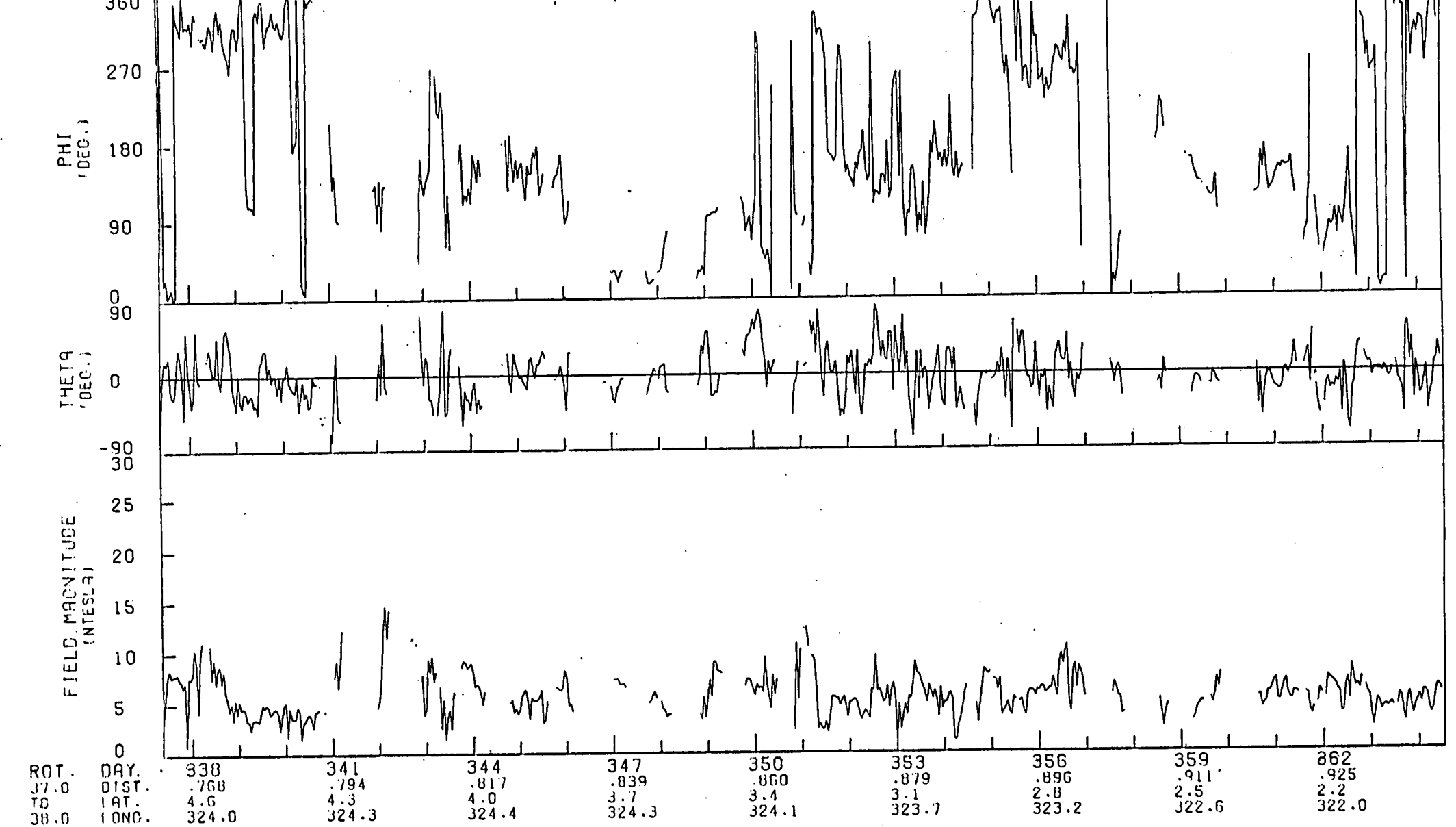


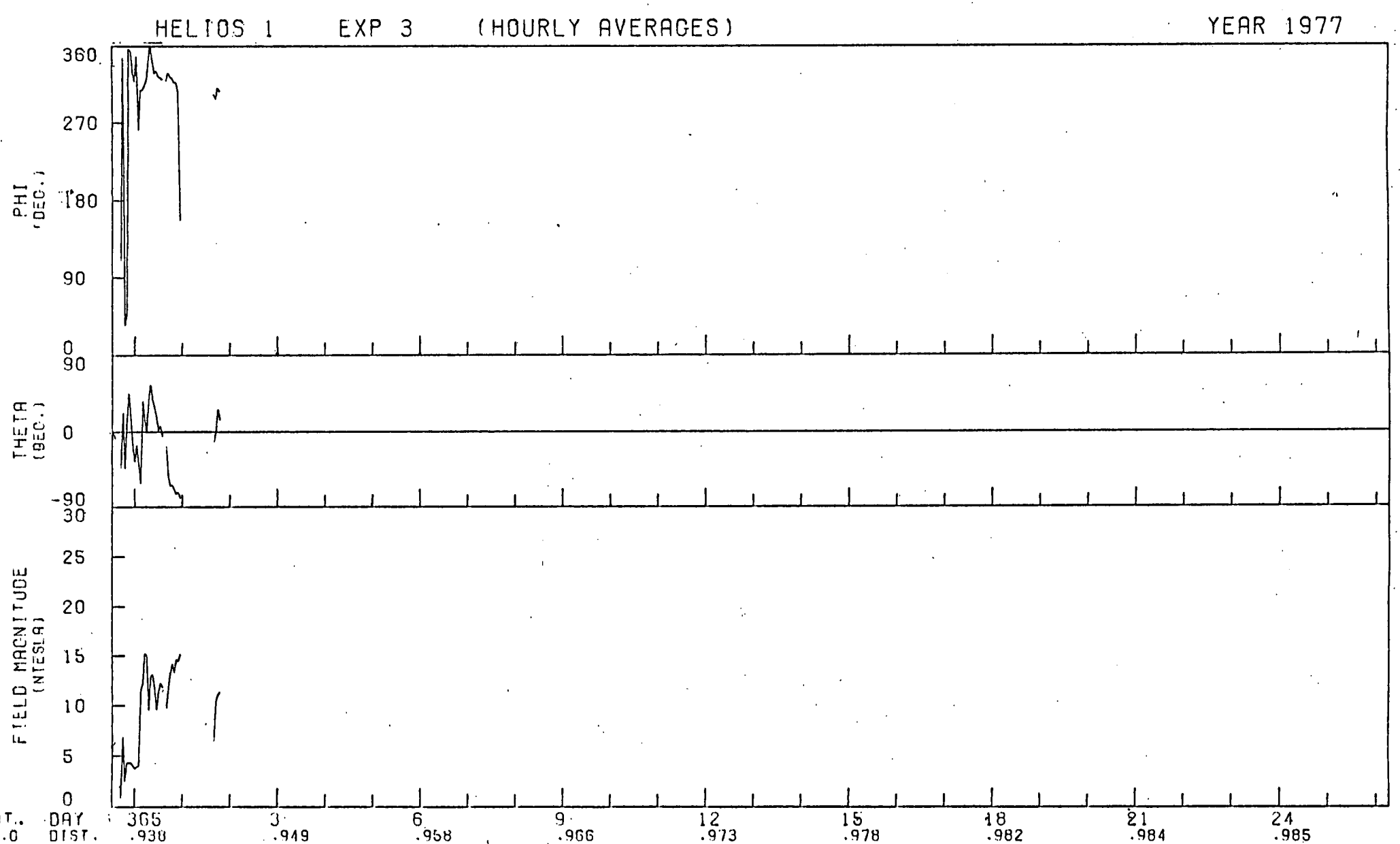
ROT.	DAY	215	218	221	224	227	230	233	236	239
33.0	DIST.	.964	.956	.946	.935	.922	.907	.891	.874	.855
TO	LAT.	-1.7	-1.9	-2.2	-2.5	-2.8	-3.0	-3.3	-3.6	-3.9
34.0	LONG.	138.6	138.0	137.3	136.7	136.2	135.8	135.4	135.1	134.9

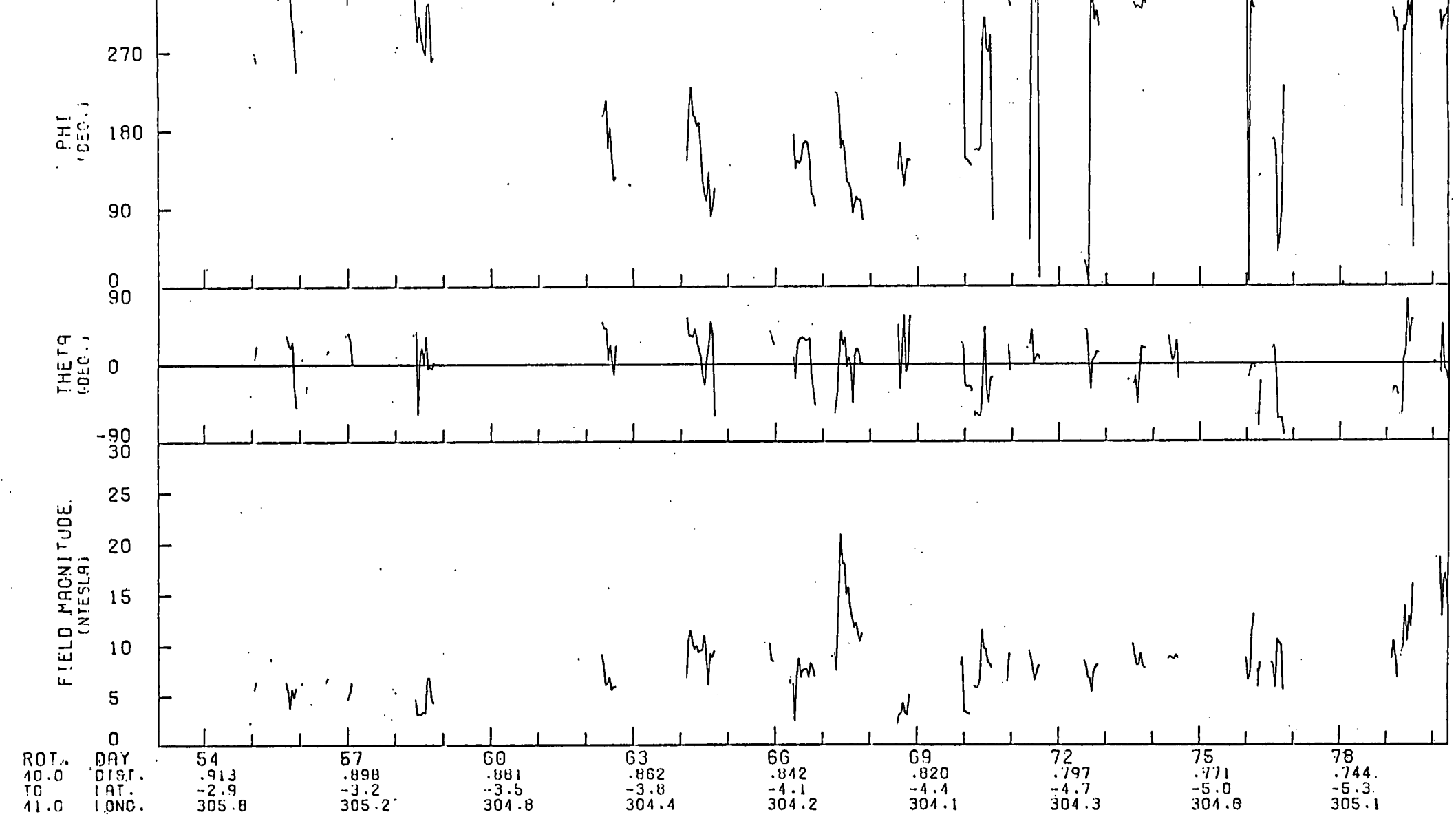

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1977
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. 34.0
DAY
DIST.
242 .834
245 .811
248 .787
251 .761
254 .733
257 .704
260 .673
263 .640
266 .605
269 .569

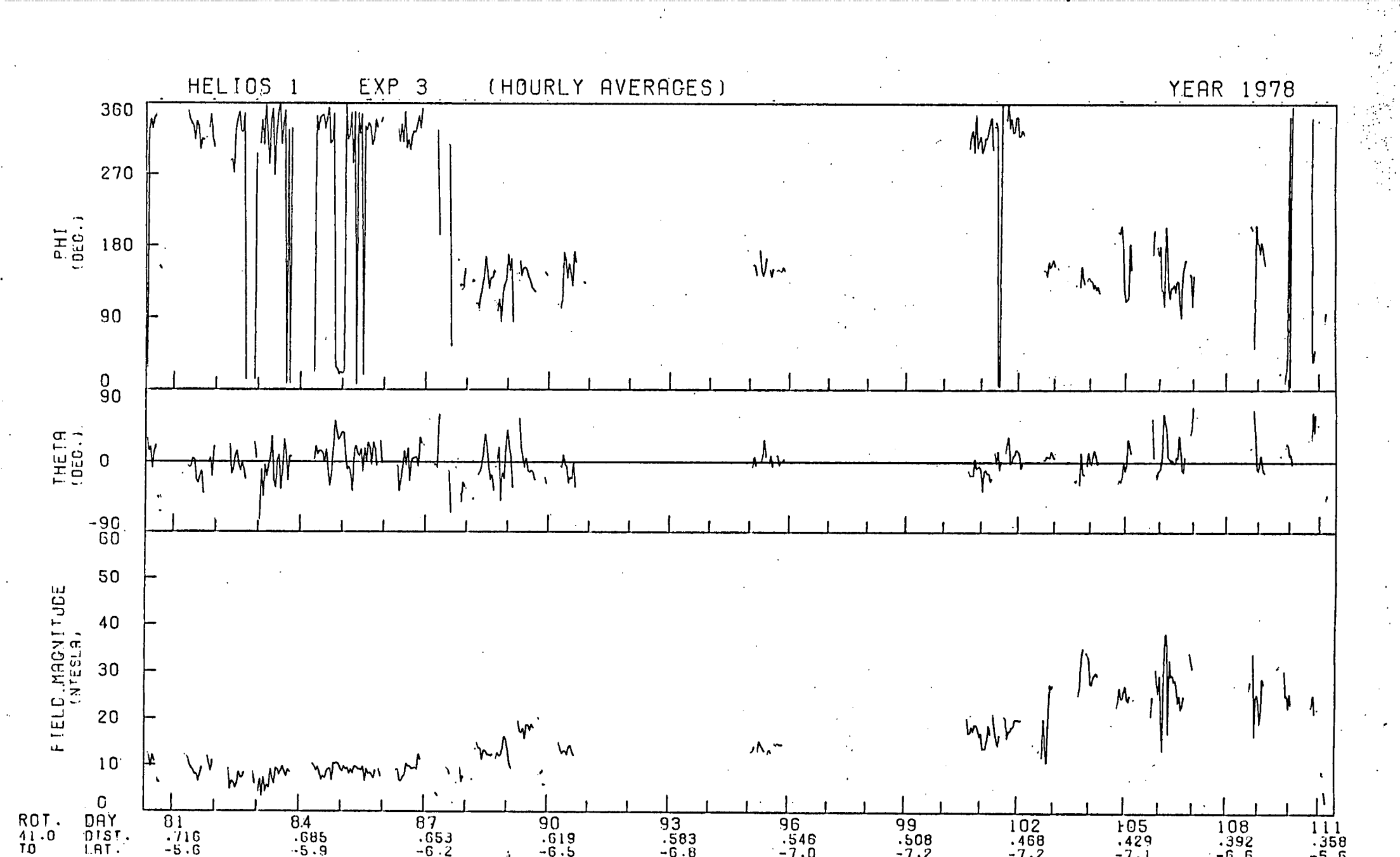

PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. 35.0 TO 36.0
DAY 270 273 276 279 282 285 288 291 294 297 300 303 306
DIST. .556 .518 .479 .440 .402 .367 .337 .317 .310 .316 .336 .365 .400
LAT. -7.0 -7.2 -7.2 -7.1 -6.7 -5.9 -4.5 -2.4 .2 2.7 4.8 6.1 6.9
LONG. 147.0 151.1 156.3 162.9 171.5 182.3 195.8 211.9 229.7 247.6 263.9 277.5 288.4

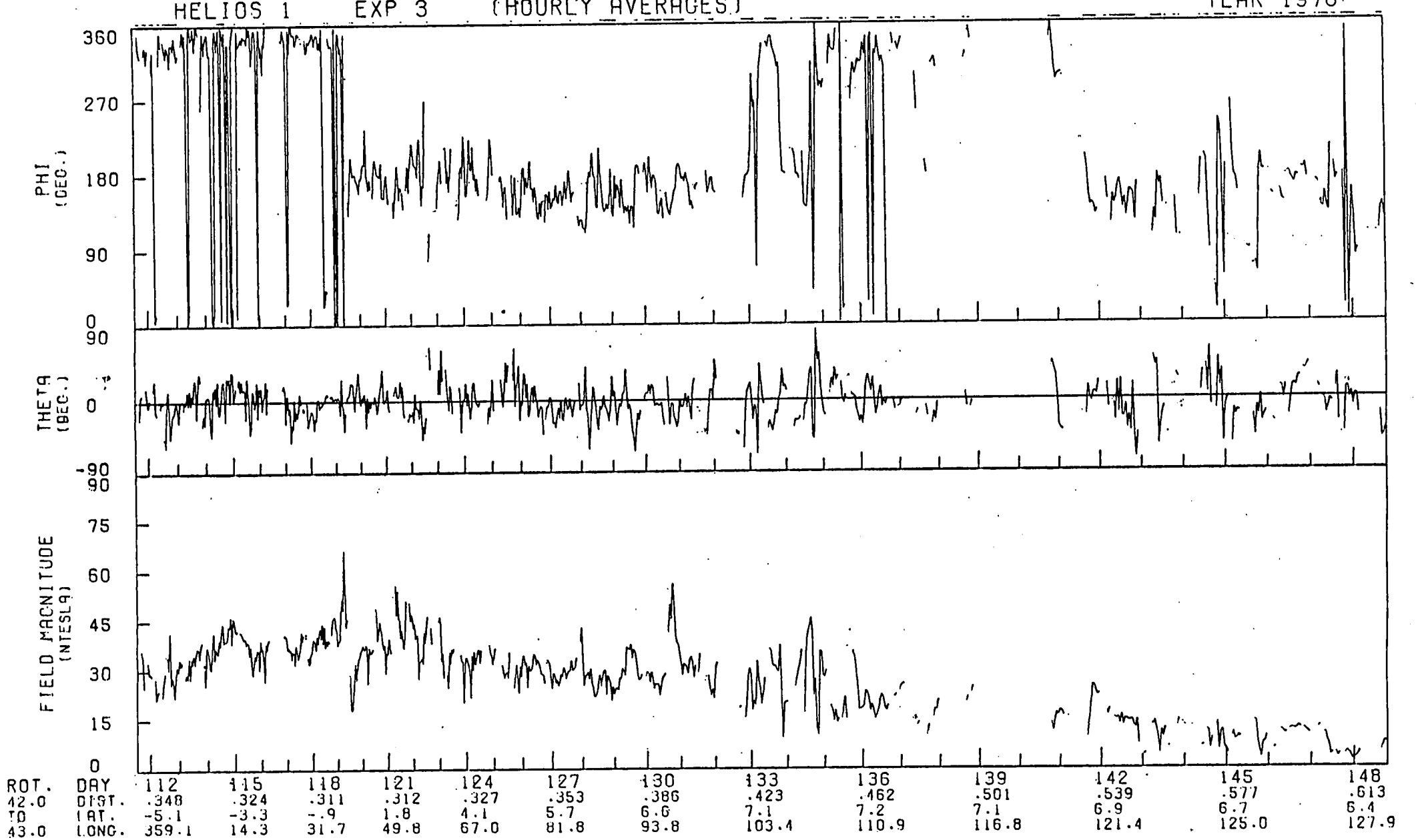

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1977
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY
308
311
314
317
320
323
326
329
332
335

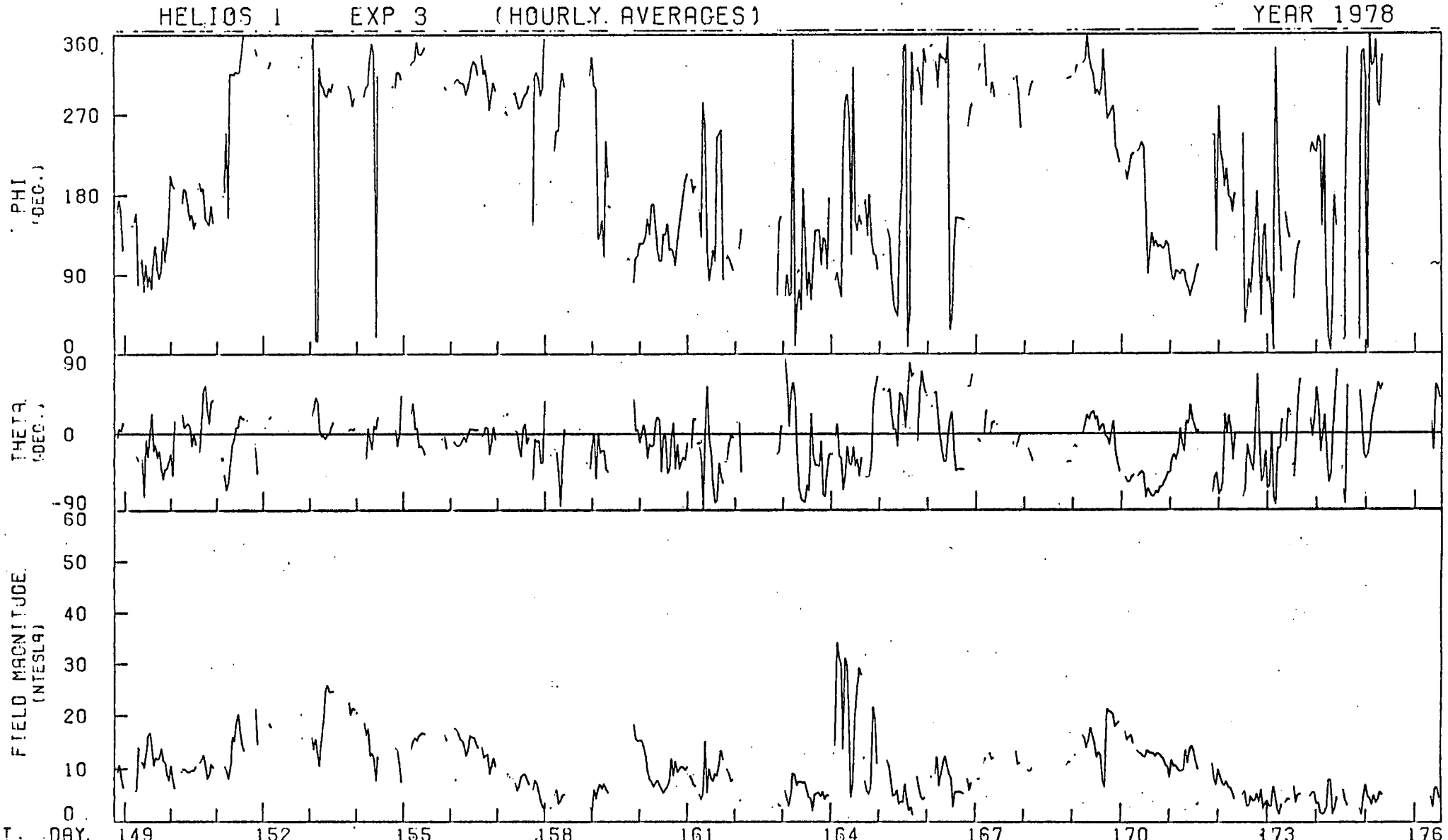

PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 37.0 TG 38.0
DAY. 338 341 344 347 350 353 356 359 362
DIST. .768 .794 .817 .839 .860 .879 .896 .911 .925
LAT. 4.6 4.3 4.0 3.7 3.4 3.1 2.8 2.5 2.2
LONG. 324.0 324.3 324.4 324.3 324.1 323.7 323.2 322.6 322.0

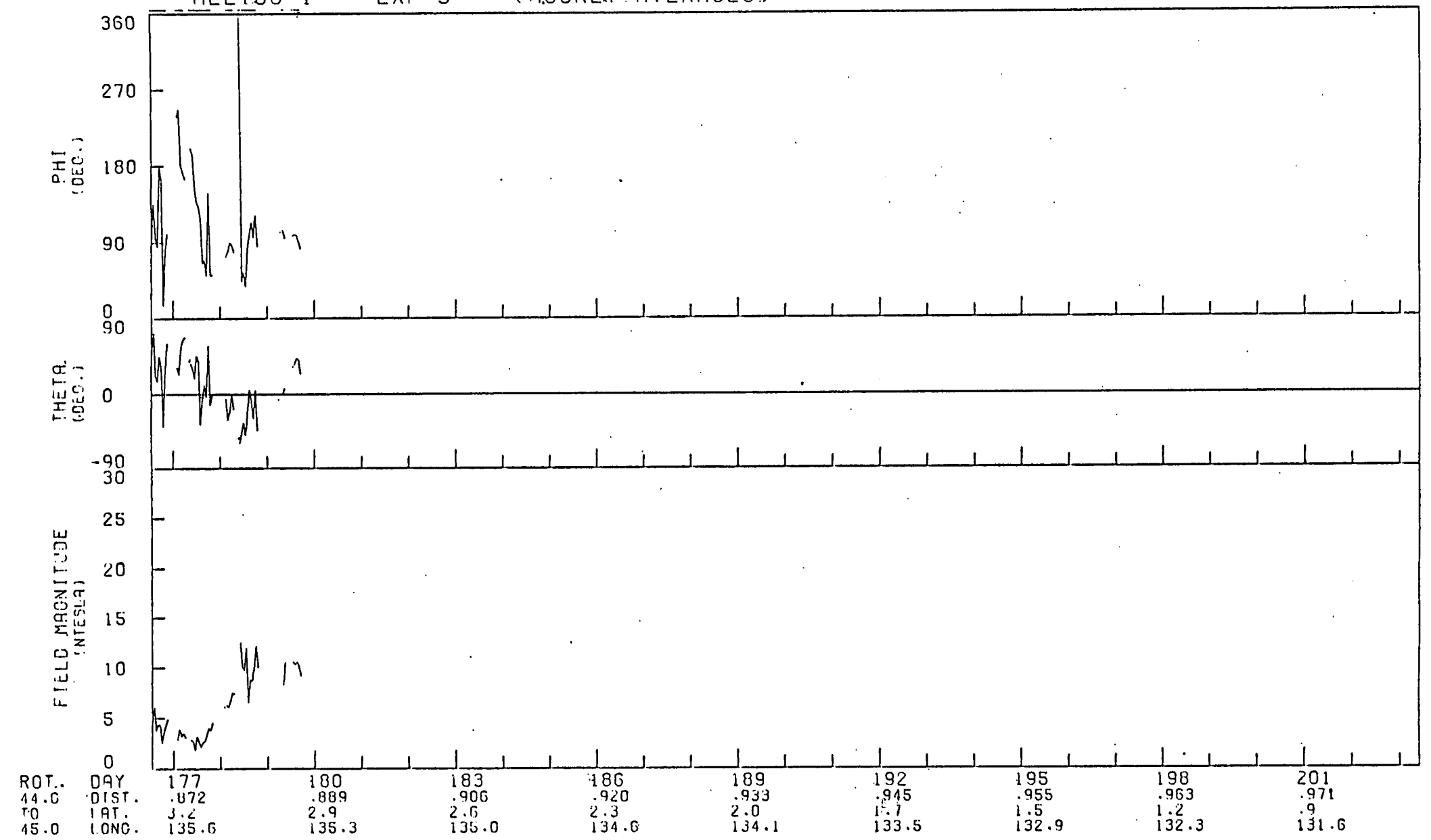

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1977
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 30.0
DAY 365 3 6 9 12 15 18 21 24
DIST. .930 .949 .958 .966 .973 .978 .982 .984 .985

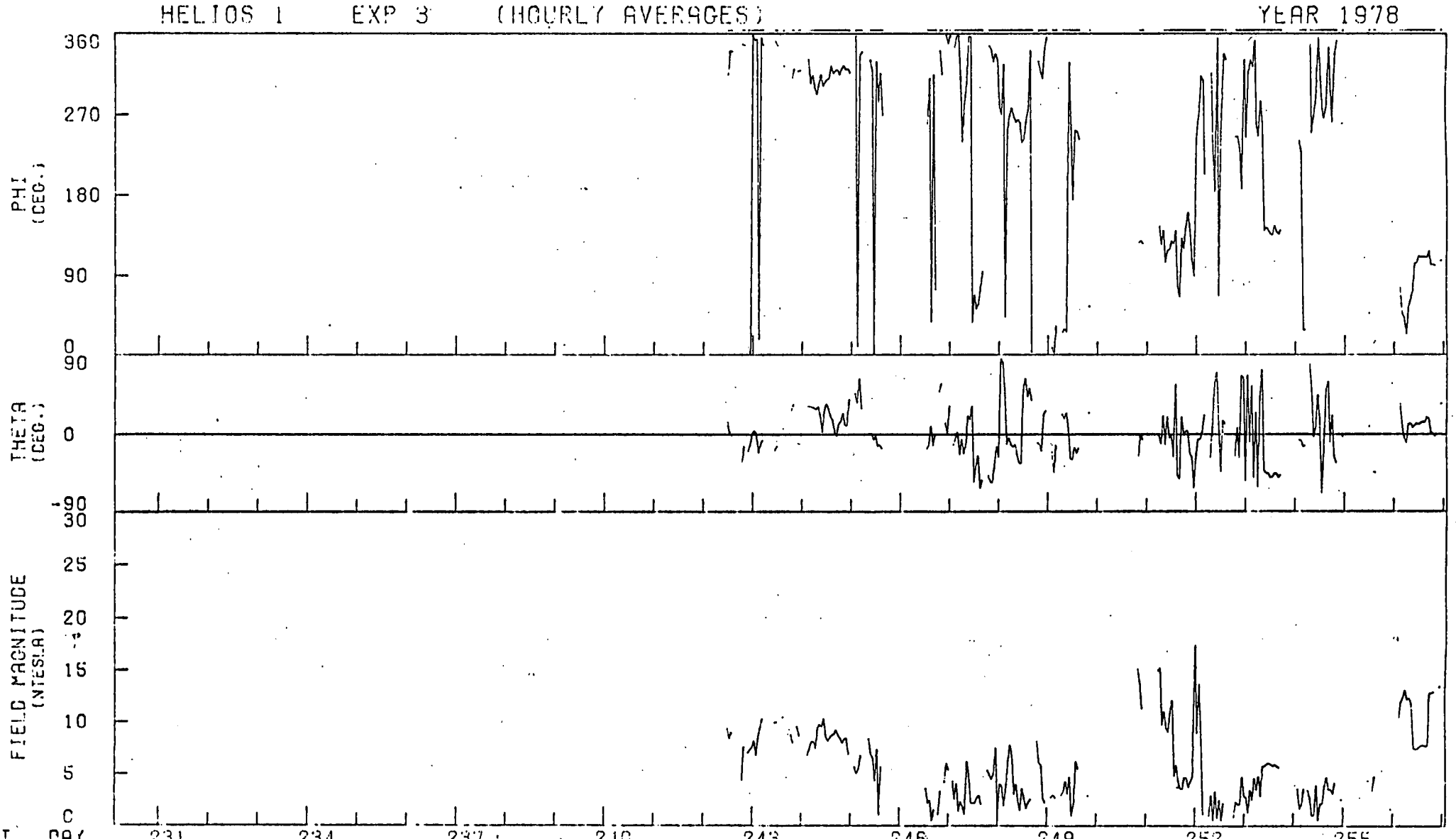

PHI
(DEG.)
270
180
90
0
THETA
(DEG.)
90
0
-90
FIELD MAGNITUDE
(NTESLA)
30
25
20
15
10
5
0
ROT. DAY
40.0 DIST.
TC LAT.
41.0 LONG.
54 .913 -2.9 305.8
57 .898 -3.2 305.2
60 .881 -3.5 304.8
63 .862 -3.8 304.4
66 .842 -4.1 304.2
69 .820 -4.4 304.1
72 .797 -4.7 304.3
75 .771 -5.0 304.6
78 .744 -5.3 305.1

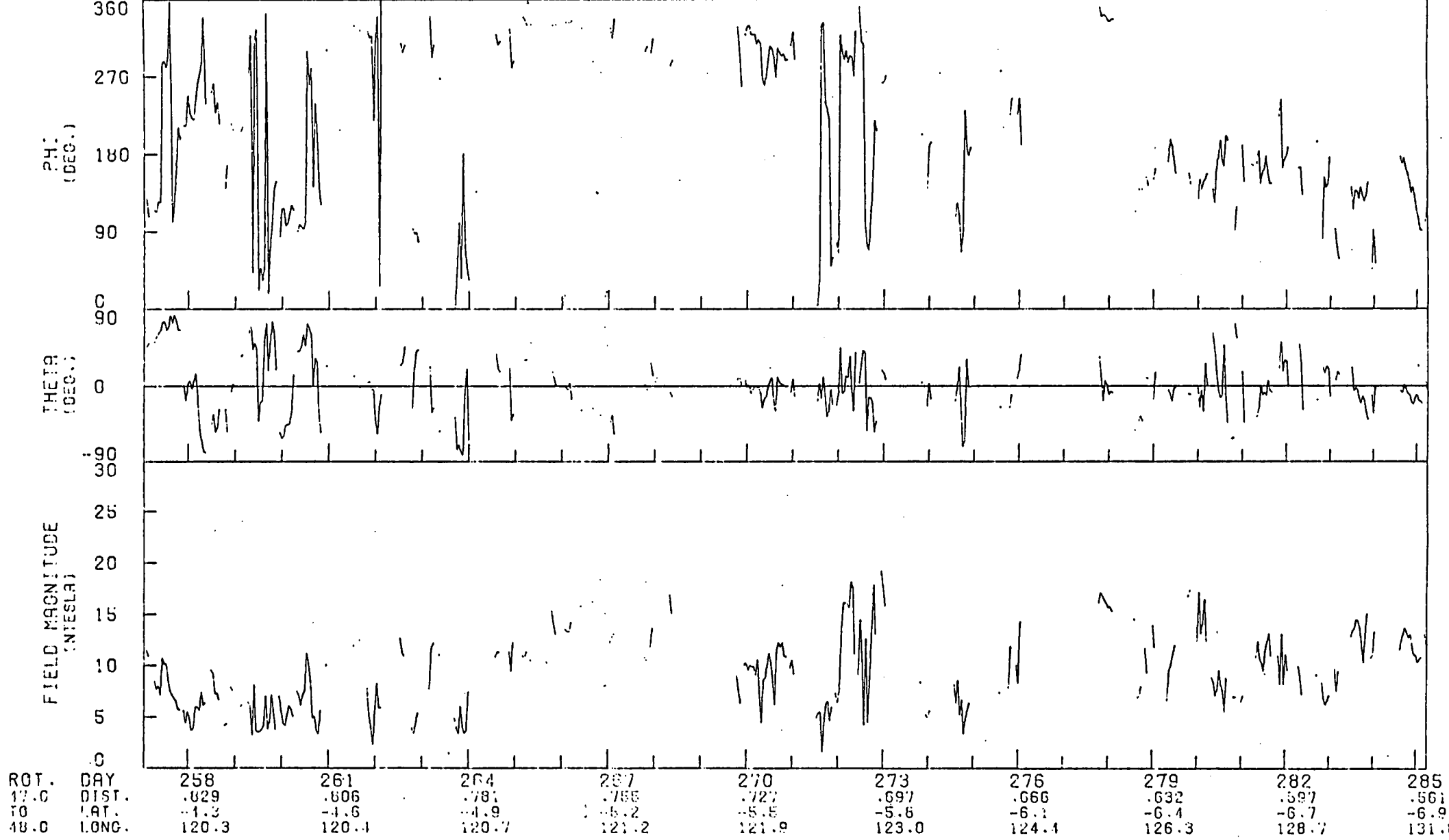

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1978
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. 41.0 TO
DAY 81 84 87 90 93 96 99 102 105 108 111
DIST. .716 .685 .653 .619 .583 .546 .508 .468 .429 .392 .358
LAT. -5.6 -5.9 -6.2 -6.5 -6.8 -7.0 -7.2 -7.2 -7.1 -6.6 -5.6

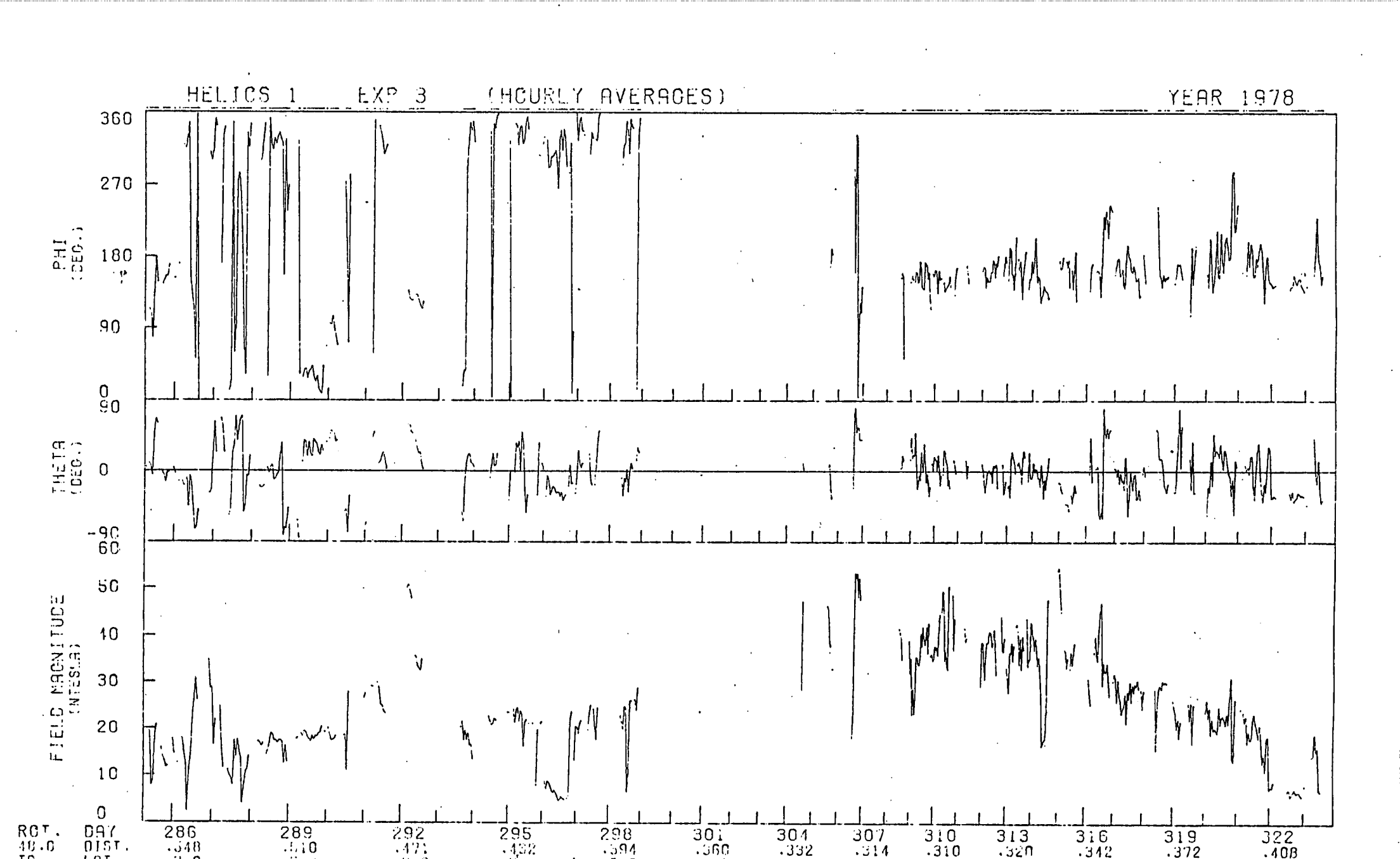

HELIOS 1 EXP 3 (HOURLY AVERAGES)
YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
90
75
60
45
30
15
0
ROT. DAY 112 115 118 121 124 127 130 133 136 139 142 145 148
42.0 DIST. .348 .324 .311 .312 .327 .353 .386 .423 .462 .501 .539 .577 .613
TO LAT. -5.1 -3.3 -.9 1.8 4.1 5.7 6.6 7.1 7.2 7.1 6.9 6.7 6.4
43.0 LONG. 359.1 14.3 31.7 49.8 67.0 81.8 93.8 103.4 110.9 116.8 121.4 125.0 127.9

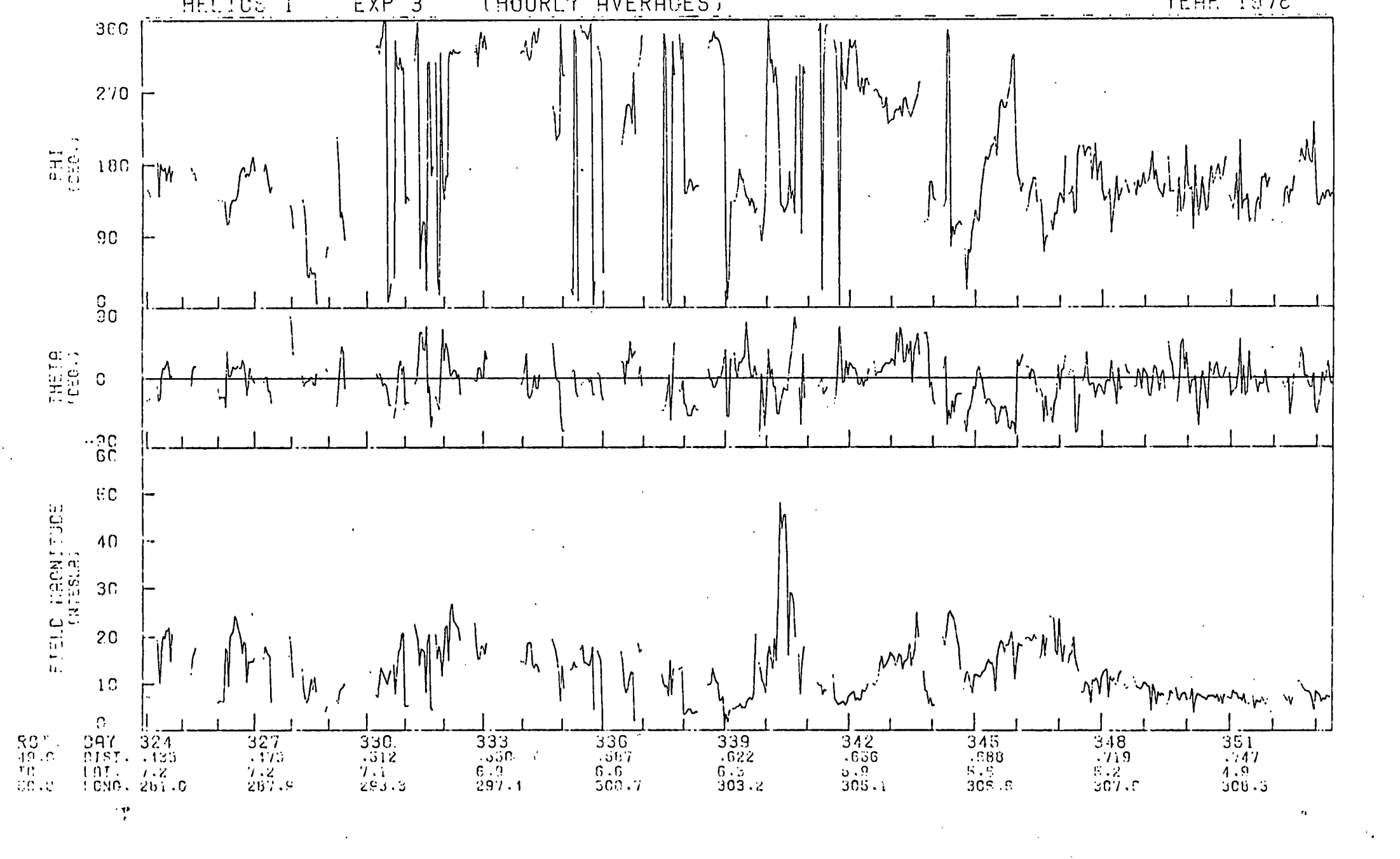

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1978
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY
149
152
155
158
161
164
167
170
173
176

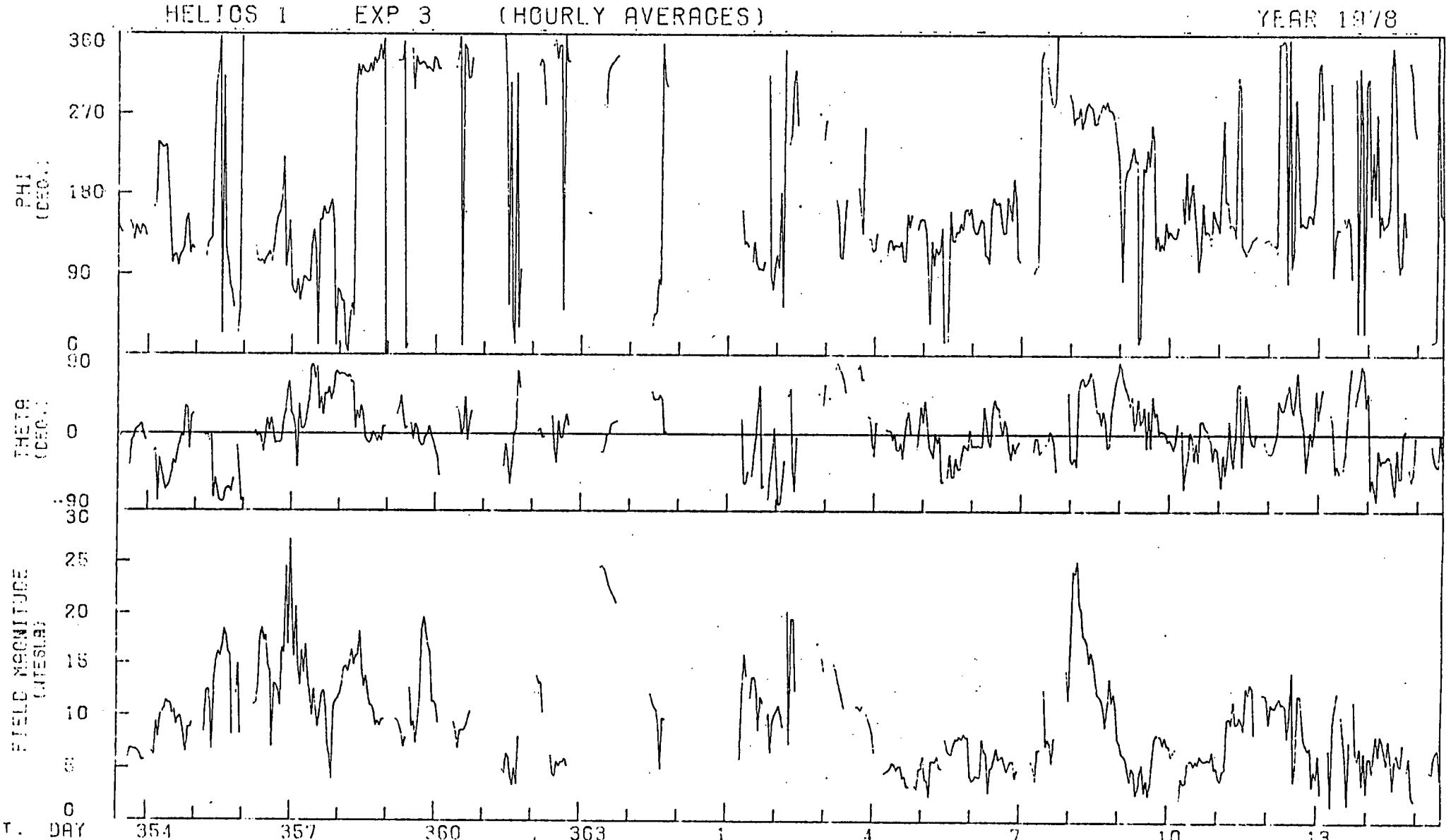

PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 44.0 TO 45.0
DAY 177 180 183 186 189 192 195 198 201
DIST. .872 .889 .906 .920 .933 .945 .955 .963 .971
LAT. 3.2 2.9 2.6 2.3 2.0 1.7 1.5 1.2 .9
LONG. 135.6 135.3 135.0 134.6 134.1 133.5 132.9 132.3 131.6

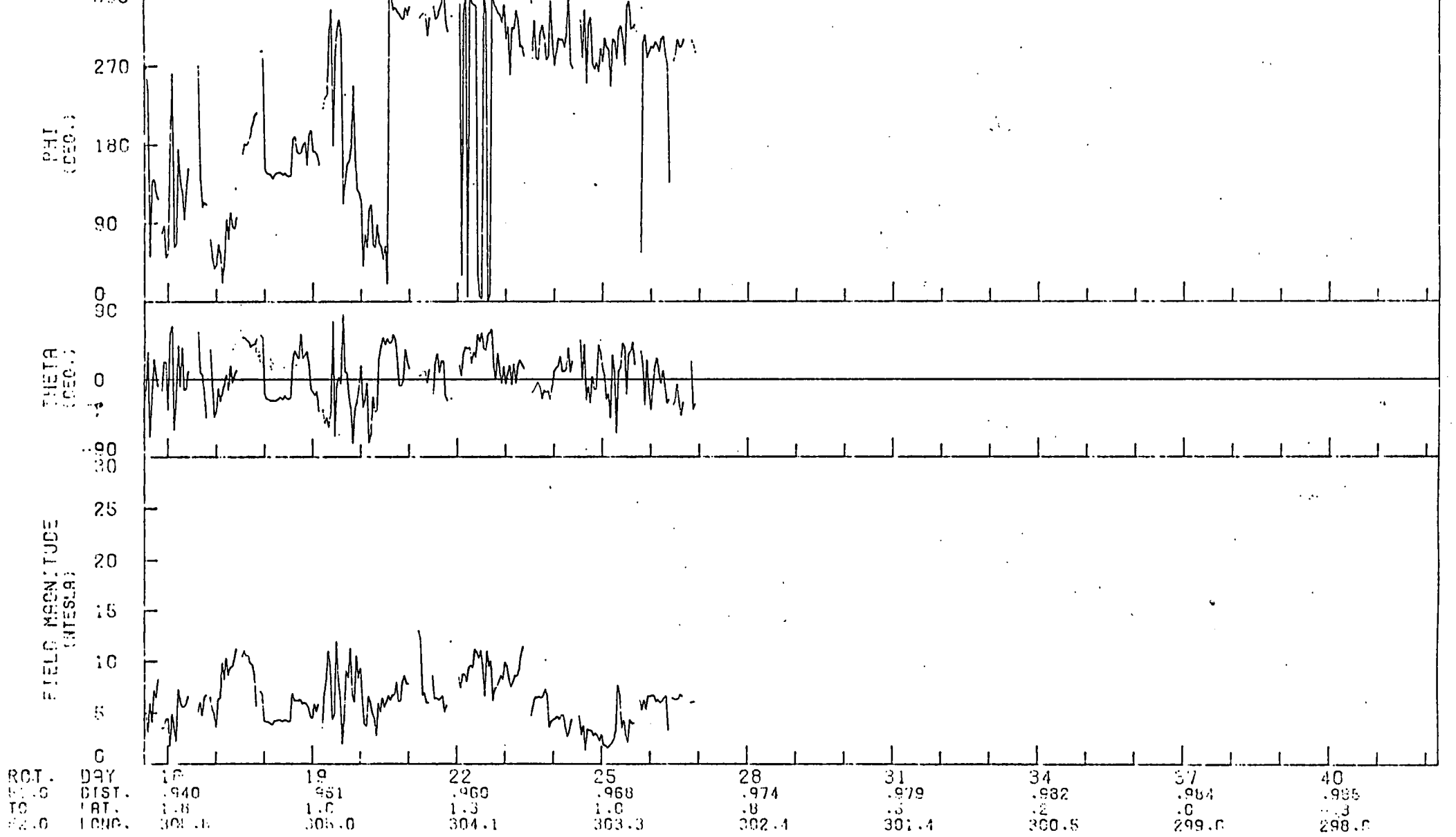

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1978
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
PDT DAY
231
234
237
240
243
246
249
252
255

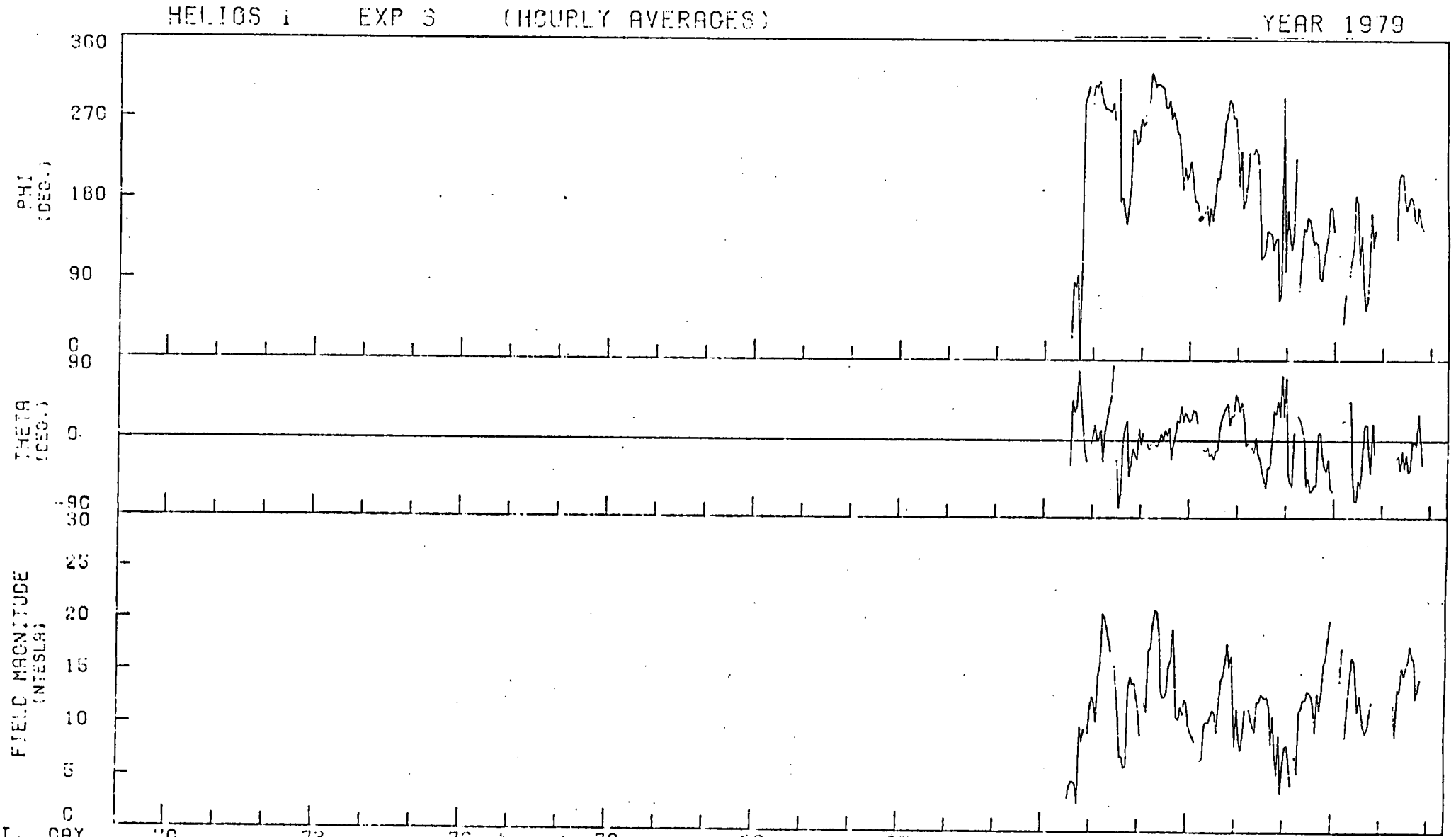

PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 17.0 TO 48.0
DAY 258 261 264 267 270 273 276 279 282 285
DIST. .829 .806 .781 .755 .727 .697 .666 .632 .597 .561
LAT. -4.3 -4.6 -4.9 -5.2 -5.5 -5.6 -6.1 -6.4 -6.7 -6.9
LONG. 120.3 120.4 120.7 121.2 121.9 123.0 124.4 126.3 128.7 131.8

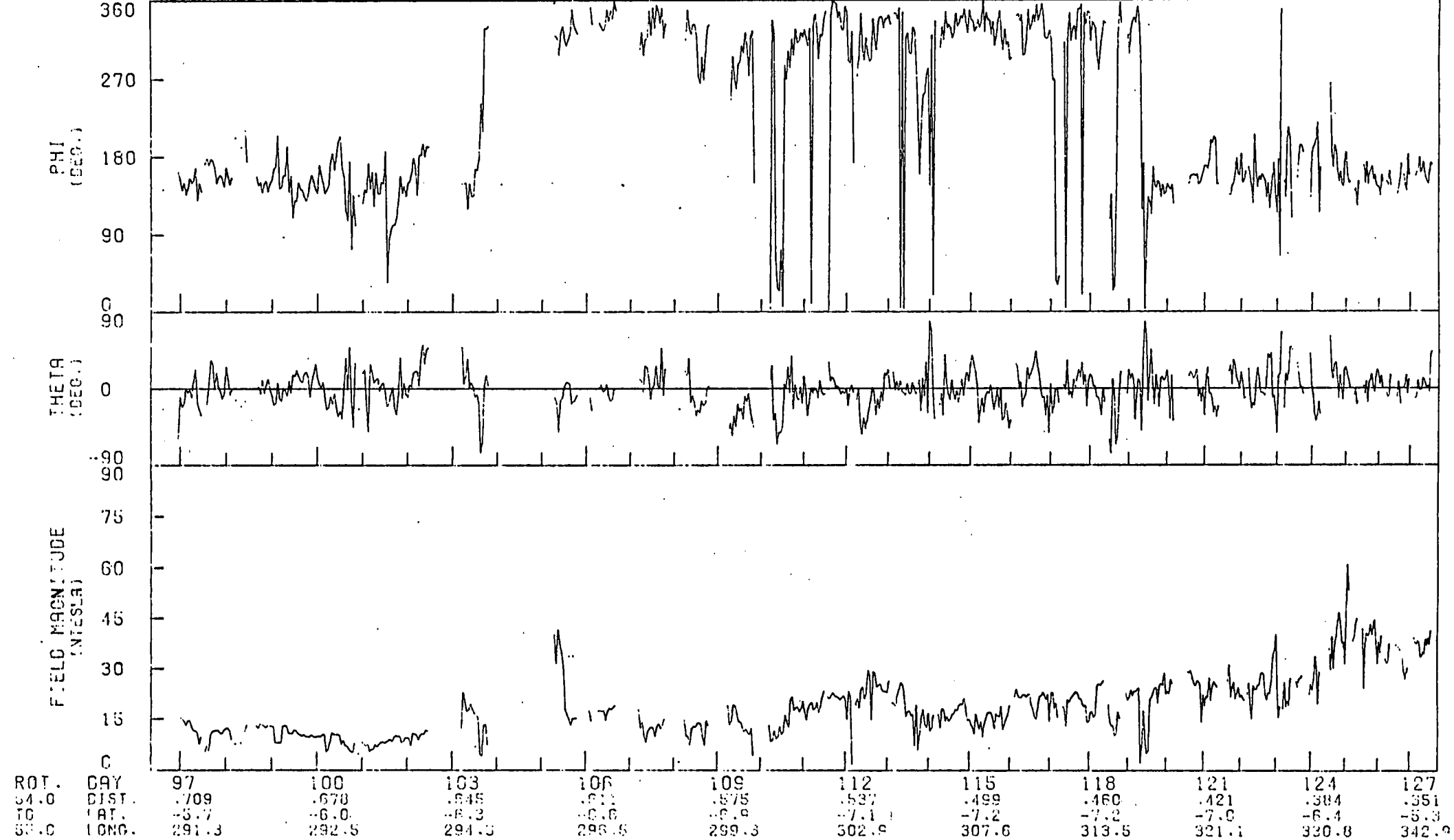

HELICS 1 EXP 3 (HOURLY AVERAGES) YEAR 1978
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. 40.0
DAY 286 289 292 295 298 301 304 307 310 313 316 319 322
DIST. .348 .510 .471 .432 .394 .360 .332 .314 .310 .320 .342 .372 .408

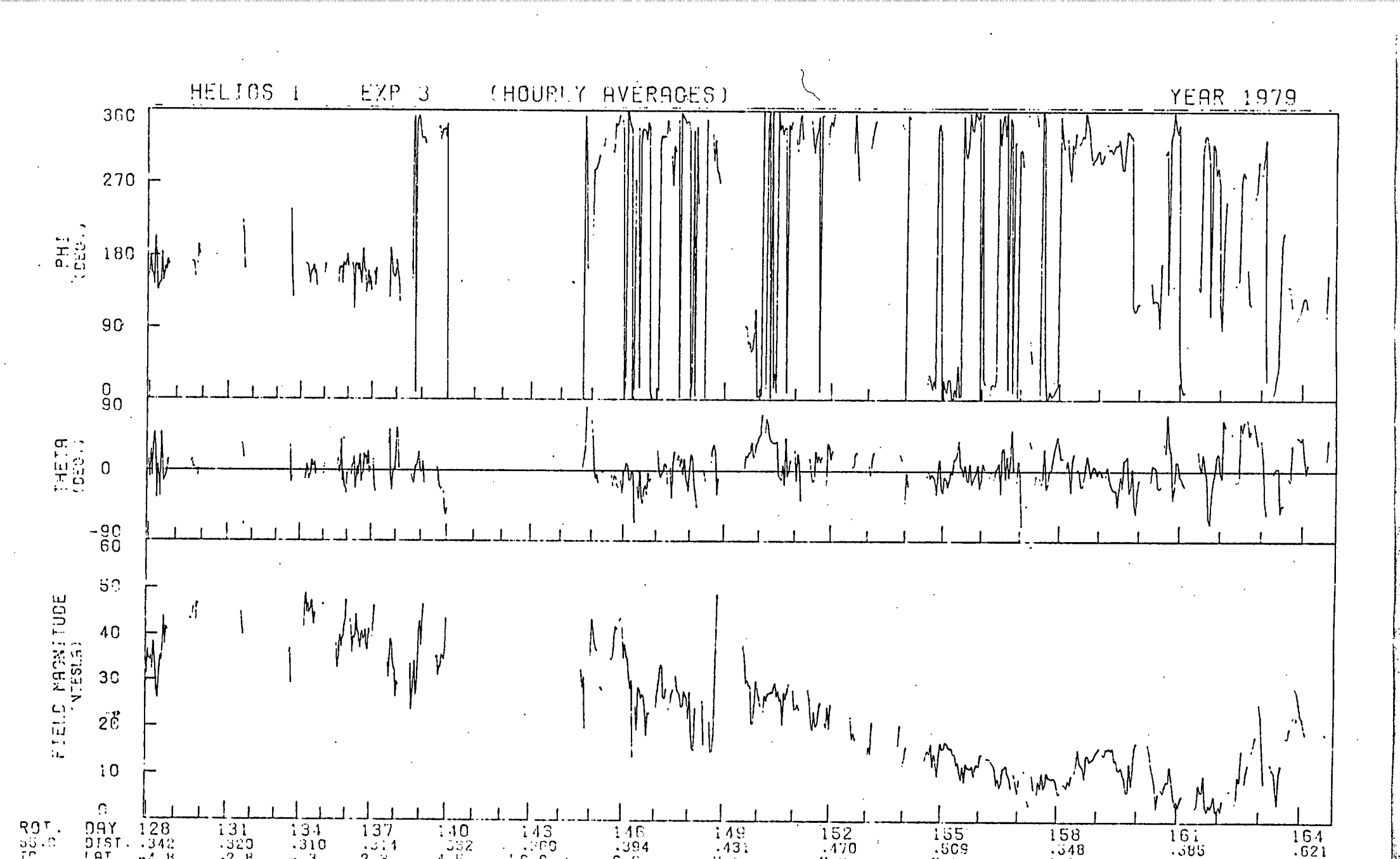

HELIOS 1 EXP 3 (HOURLY AVERAGES)
YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (GAMMAS)
60
50
40
30
20
10
0
DAY 324 327 330 333 336 339 342 345 348 351
DIST. .133 .173 .312 .550 .567 .622 .656 .688 .719 .747
LAT. 7.2 7.2 7.1 6.9 6.6 6.3 6.0 5.9 5.2 4.9
LONG. 261.0 287.9 293.3 297.1 300.7 303.2 305.1 306.6 307.9 308.3

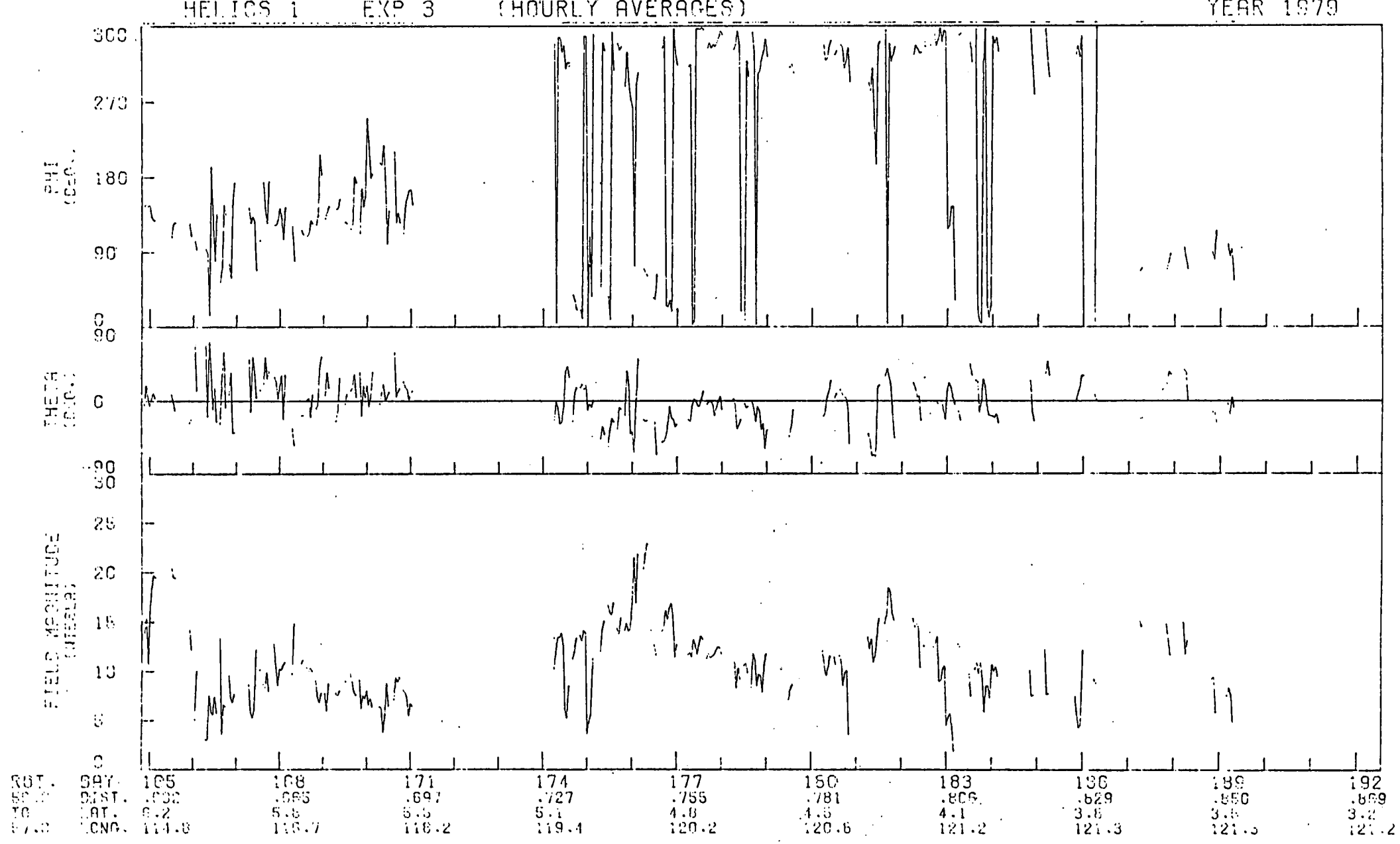

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1978
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (GAMMA)
30
25
20
15
10
5
0
ECT. DAY
354
357
360
363
1
4
7
10
13

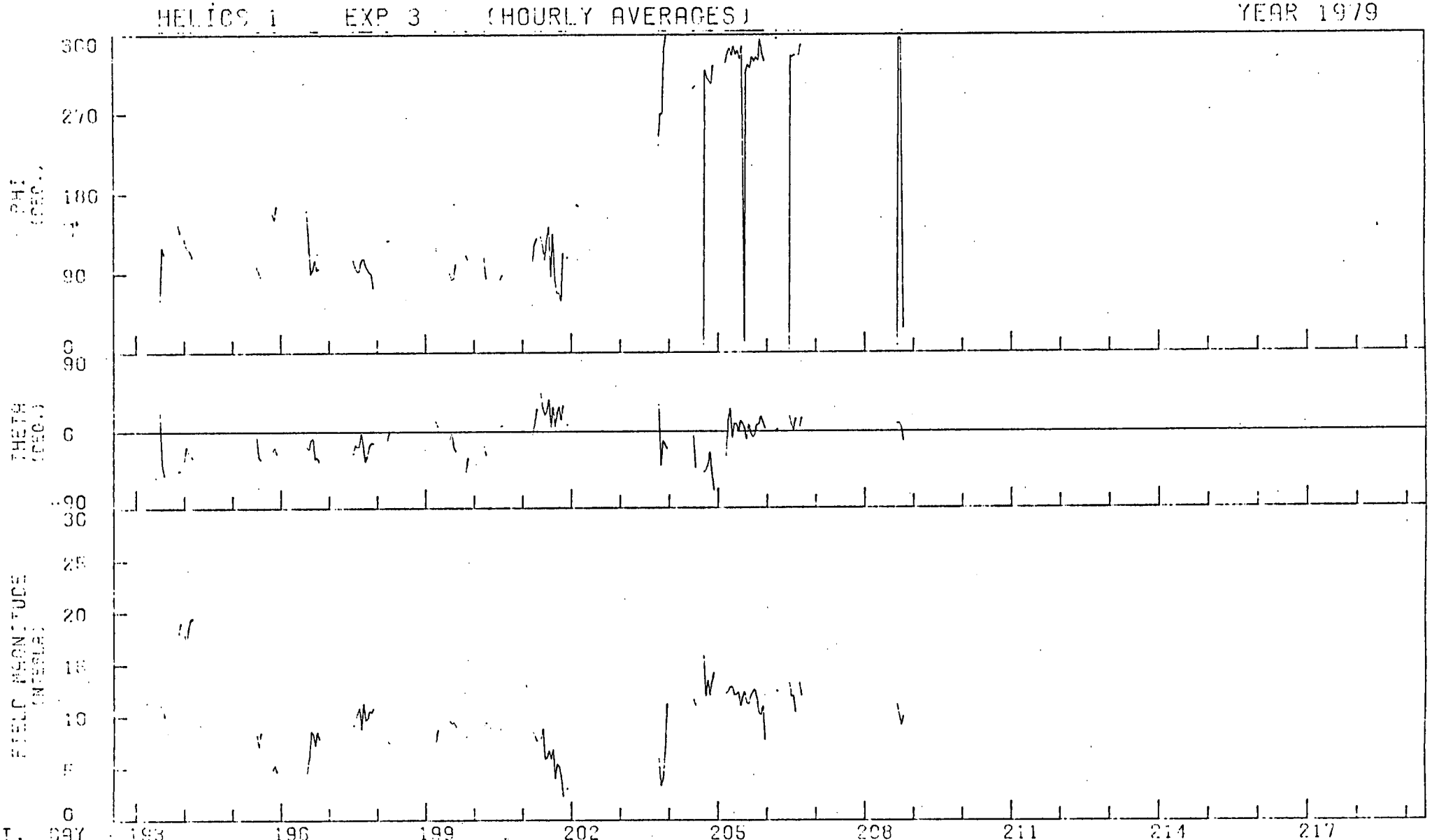

PHI
(DEG.)
270
180
90
0
THETA
(DEG.)
90
0
-90
FIELD MAGNITUDE
(NTESLA)
30
25
20
15
10
5
0
ROT. DAY 16 19 22 25 28 31 34 37 40
DIST. .940 .951 .960 .968 .974 .979 .982 .984 .985
LAT. 1.6 1.0 1.3 1.0 .8 .5 .2 .0 -.3
LONG. 308.6 305.0 304.1 303.3 302.4 301.4 300.5 299.6 298.6

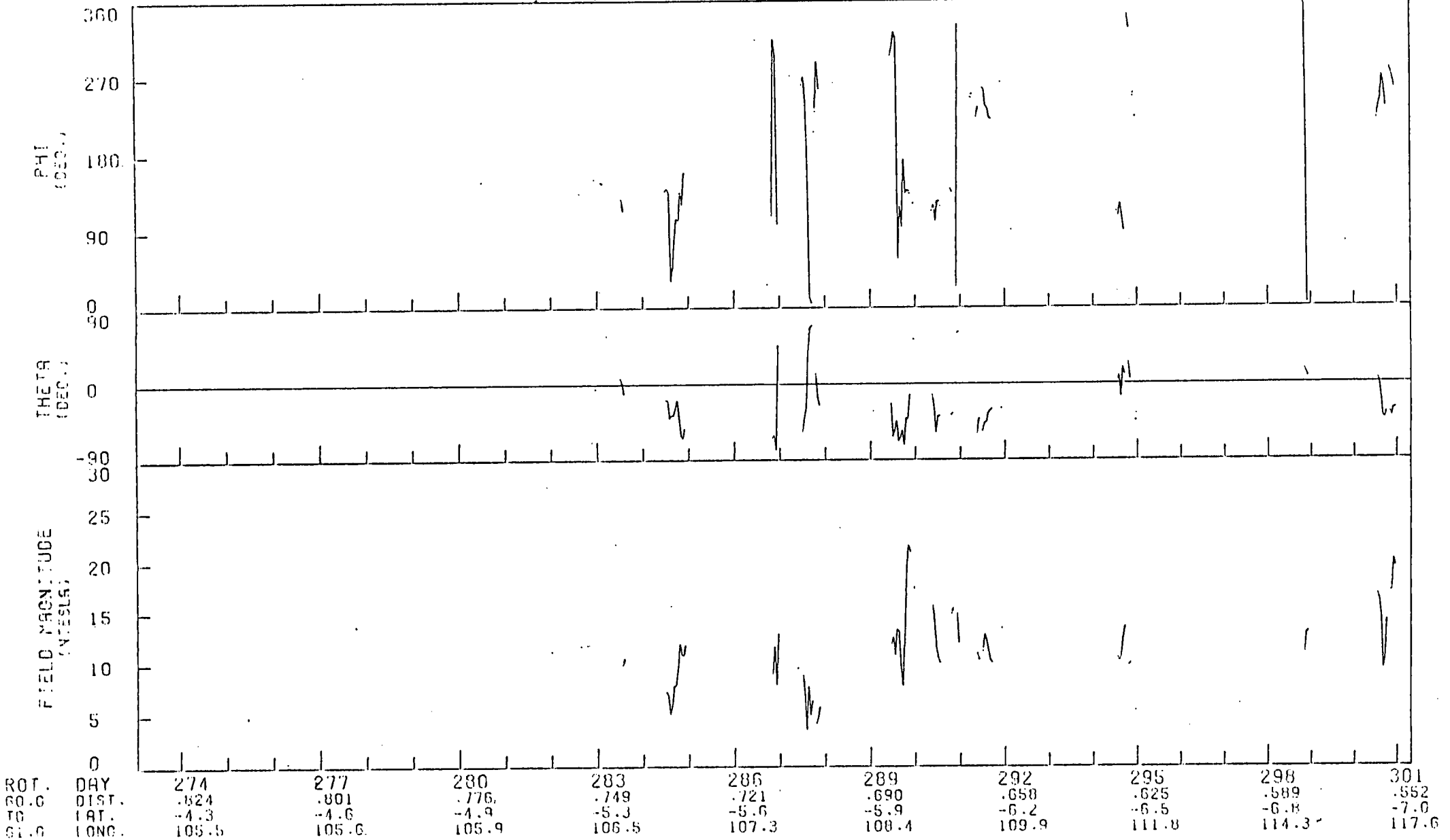

HELIOS 1 EXP 5 (HOURLY AVERAGES)
YEAR 1979
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
DOY

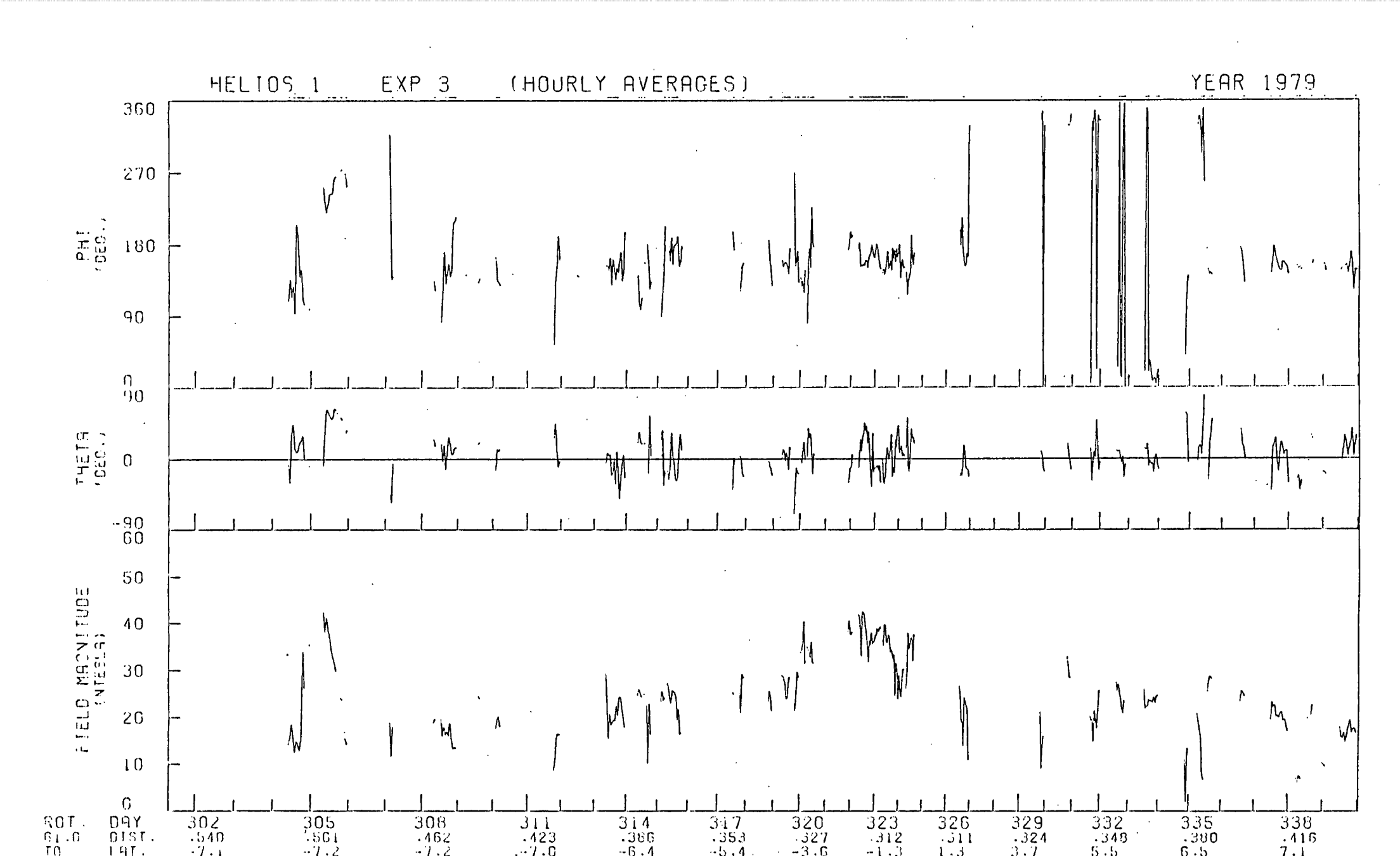

PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
90
75
60
45
30
15
0
ROT.
DAY
DIST.
LAT.
LONG.
97
100
103
106
109
112
115
118
121
124
127
.709
.678
.645
.575
.537
.499
.460
.421
.384
.351
-5.7
-6.0
-7.2
-7.2
-7.0
-6.4
291.3
292.5
307.6
313.5
321.1
330.8
342.9

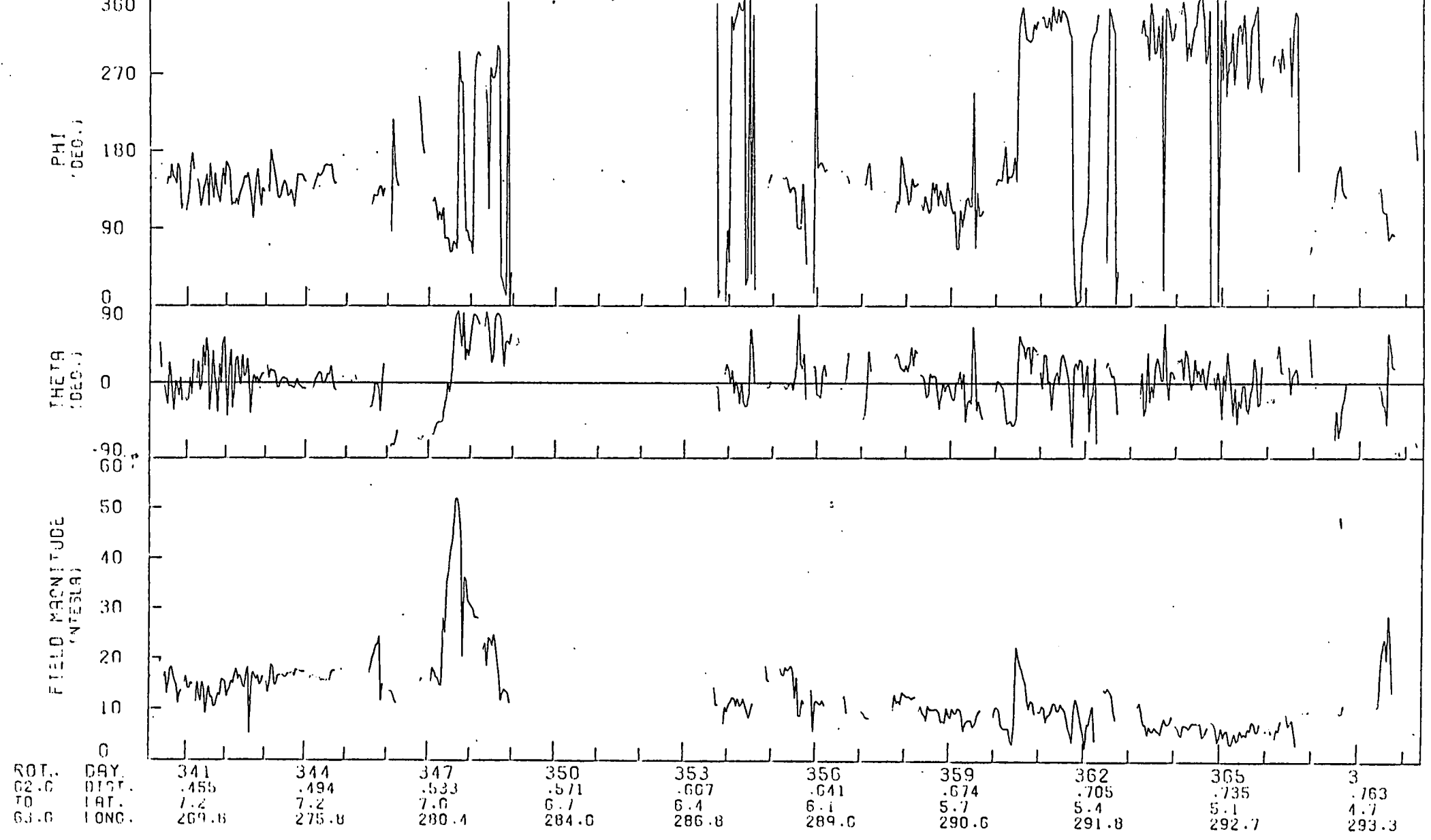

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1979
PHI
360
270
180
90
0
THETA
90
0
-90
FIELD MAGNITUDE
60
50
40
30
20
10
0
ROT. DAY 128 131 134 137 140 143 146 149 152 155 158 161 164
DIST. .342 .329 .310 .314 .332 .360 .394 .431 .470 .509 .548 .585 .621

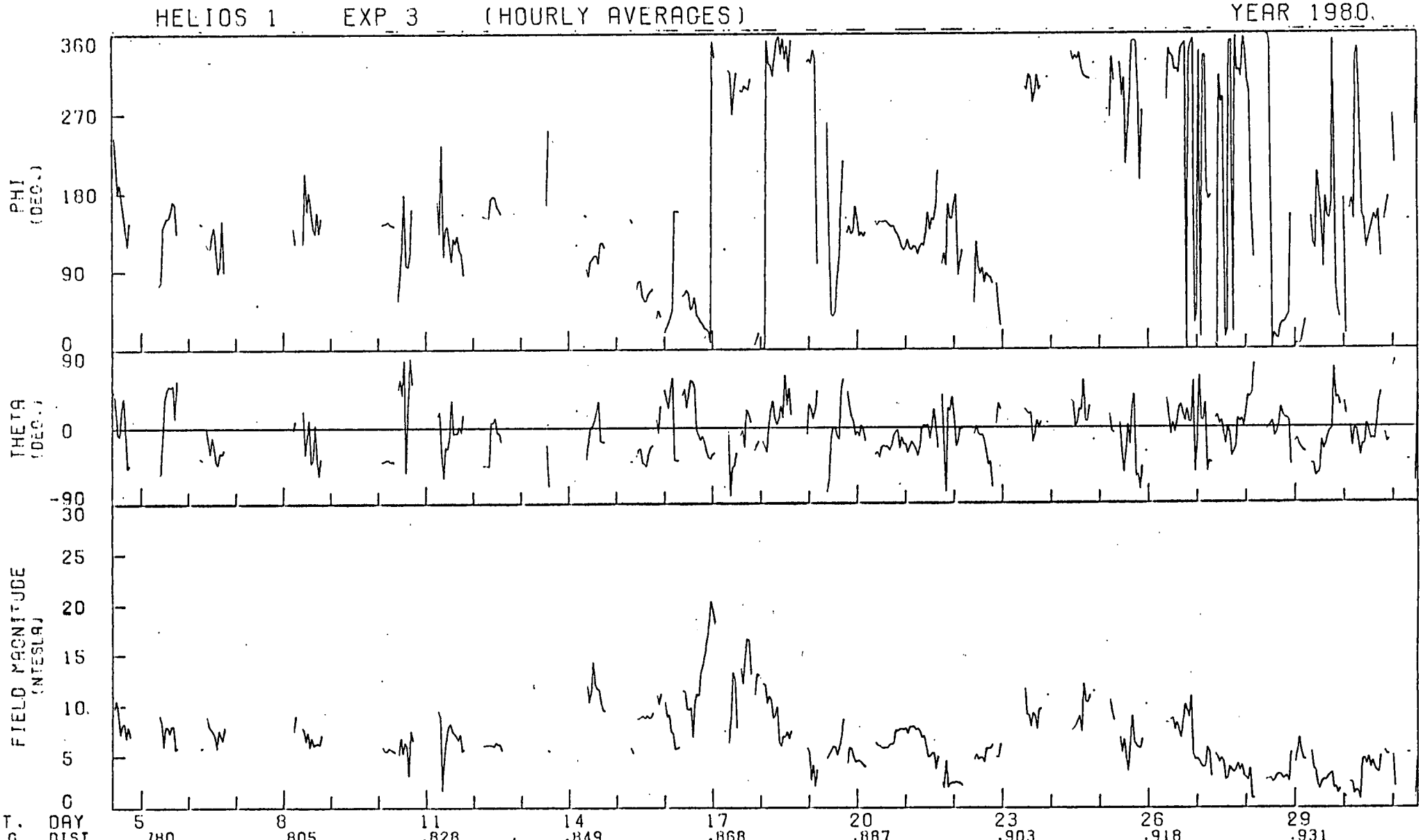

HELICS 1 EXP 3 (HOURLY AVERAGES) YEAR 1979
PHI
THETA
FIELD MAGNITUDE
300
270
180
90
0
90
0
90
30
25
20
15
10
5
0
DAY 165 168 171 174 177 180 183 186 189 192
DIST. .692 .665 .697 .727 .755 .781 .809 .629 .650 .669
LAT. 6.2 5.6 5.5 5.1 4.8 4.5 4.1 3.6 3.5 3.2
LONG. 114.8 116.7 118.2 119.4 120.2 120.6 121.2 121.3 121.5 121.2

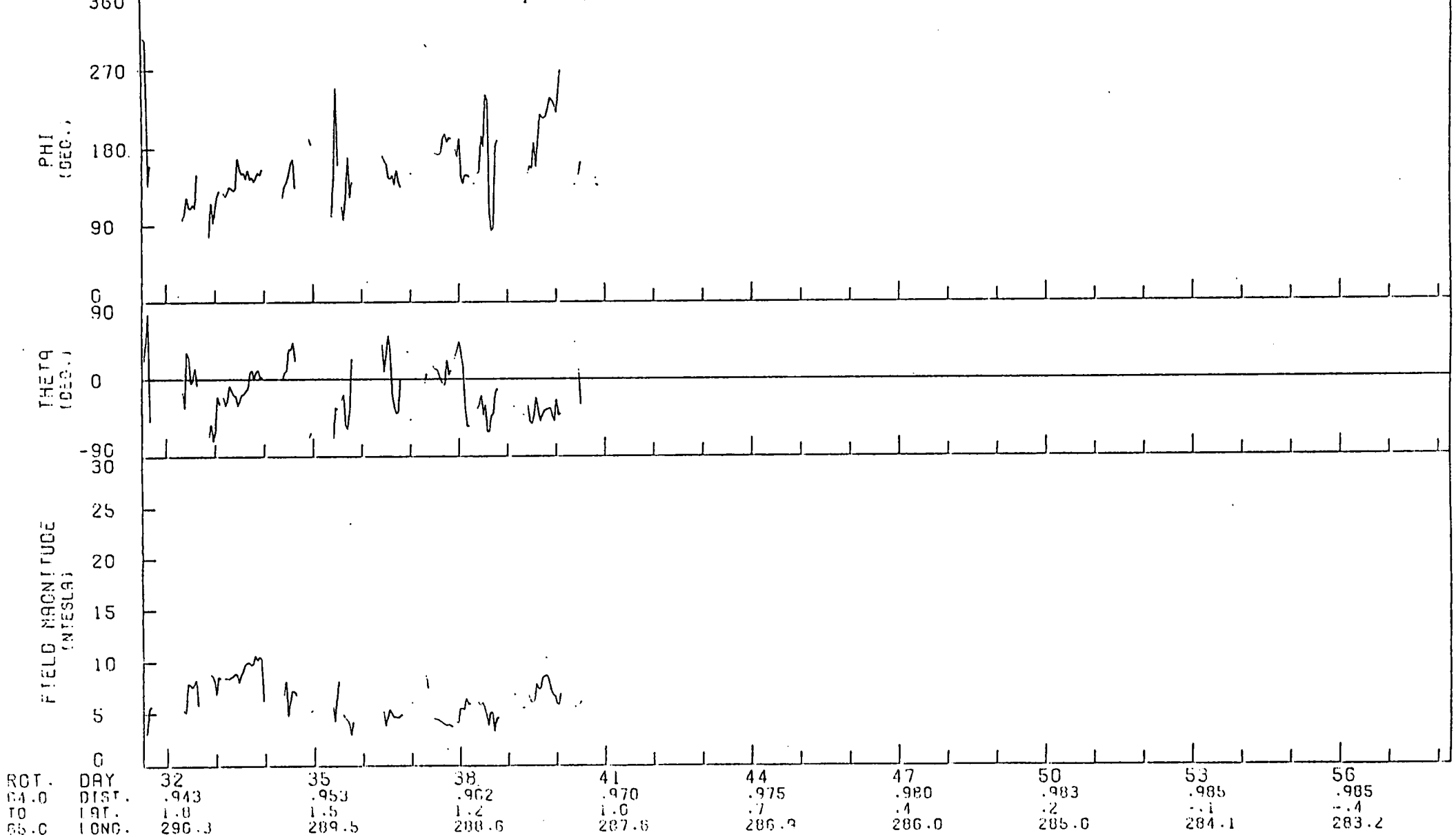

HELICS 1 EXP 3 (HOURLY AVERAGES)
YEAR 1979
PHI (DEG.)
300
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NT)
30
25
20
15
10
5
0
RCI, DAY
193
196
199
202
205
208
211
214
217

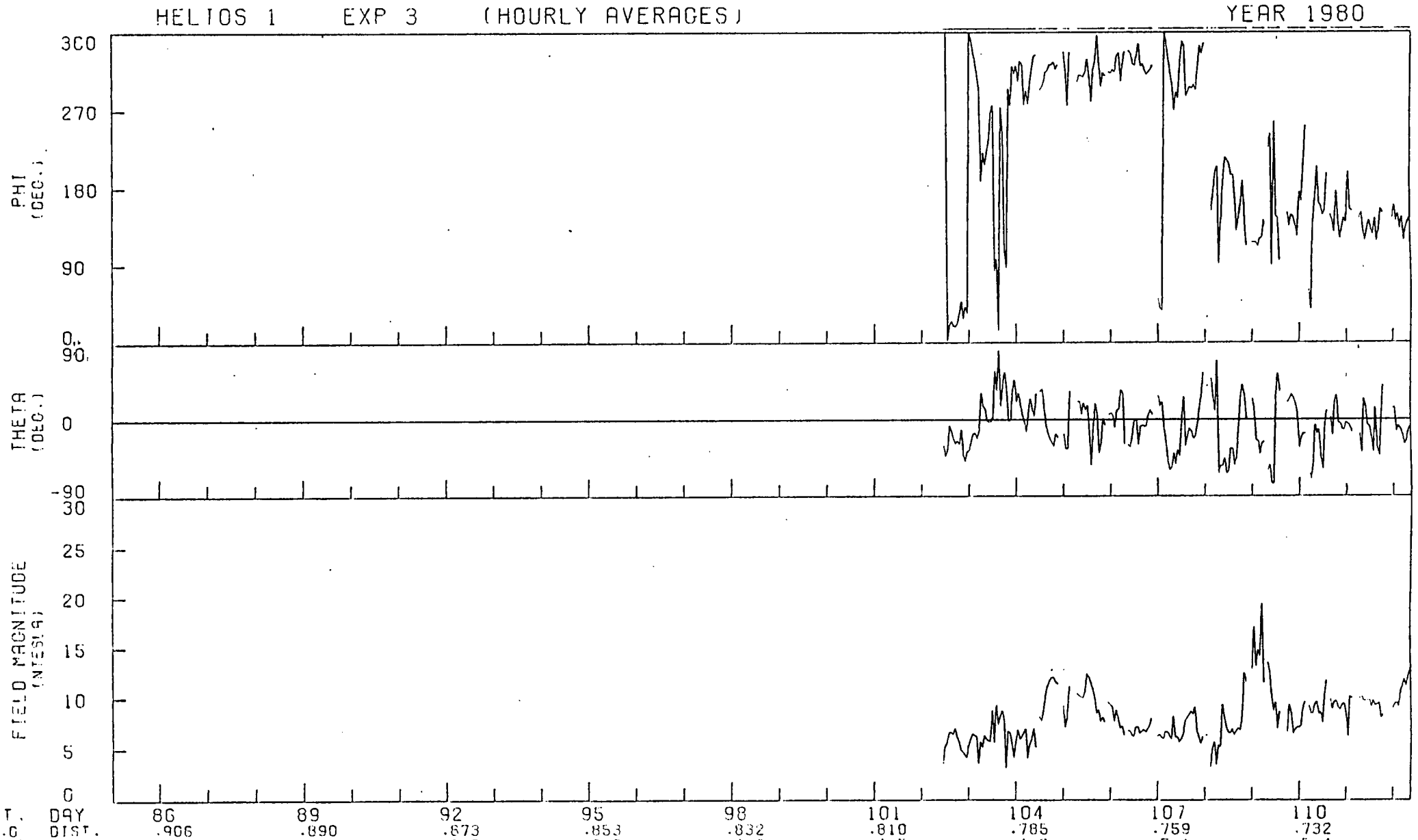

PHI
360
270
180
90
0
THETA
90
0
-90
FIELD MAGNITUDE
30
25
20
15
10
5
0
ROT.
60.6
TG
61.6
DAY
DIST.
LAT.
LONG.
274
.824
-4.3
105.5
277
.801
-4.6
105.6
280
.776
-4.9
105.9
283
.749
-5.3
106.5
286
.721
-5.6
107.3
289
.690
-5.9
108.4
292
.658
-6.2
109.9
295
.625
-6.5
111.8
298
.589
-6.8
114.3
301
.552
-7.0
117.6

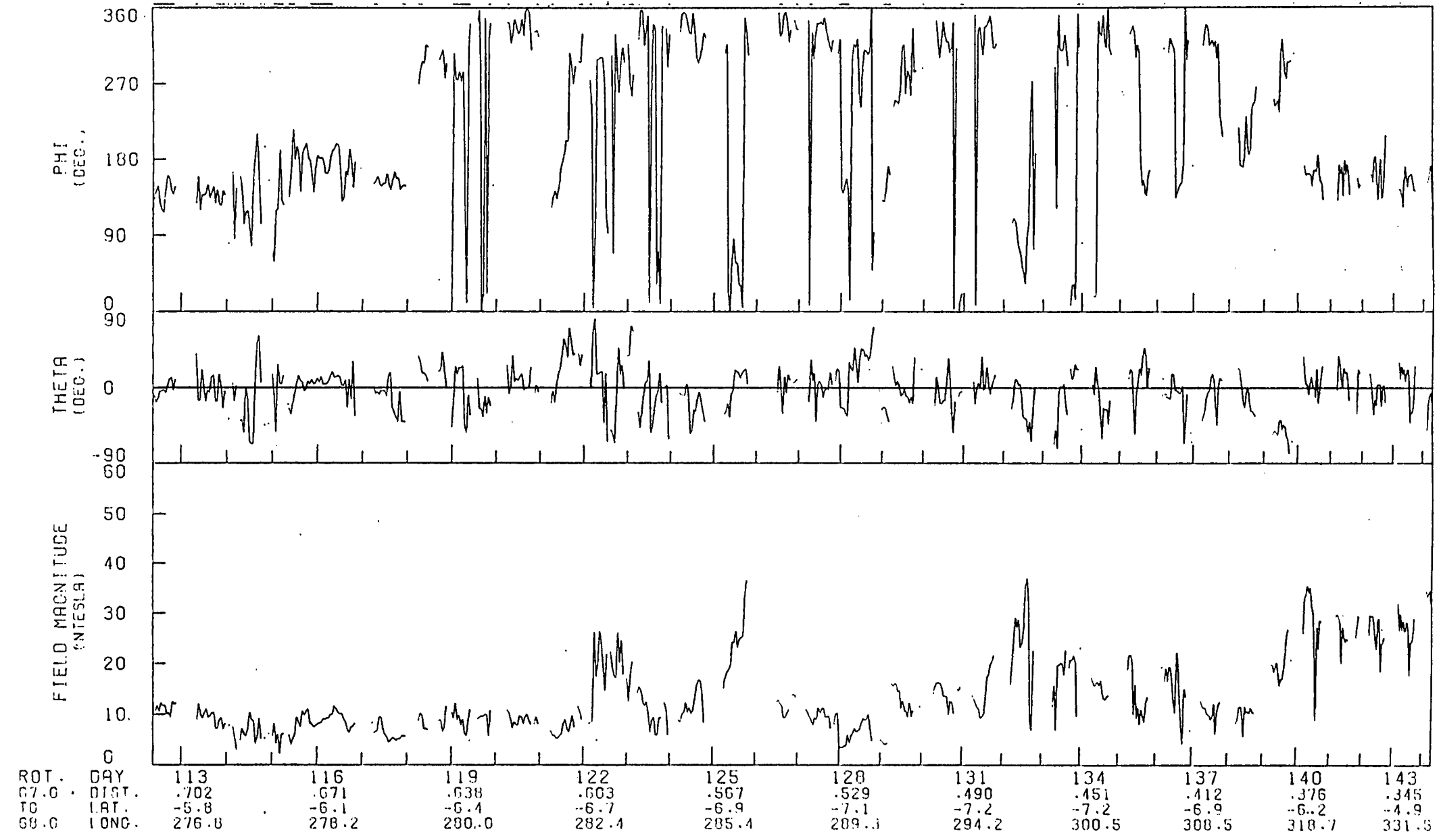

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1979
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY 302 305 308 311 314 317 320 323 326 329 332 335 338
61.6 DIST. .540 .501 .462 .423 .386 .353 .327 .312 .311 .324 .349 .380 .416
TO LAT. -7.1 -7.2 -7.2 -7.0 -6.4 -5.4 -3.6 -1.3 1.3 3.7 5.5 6.5 7.1

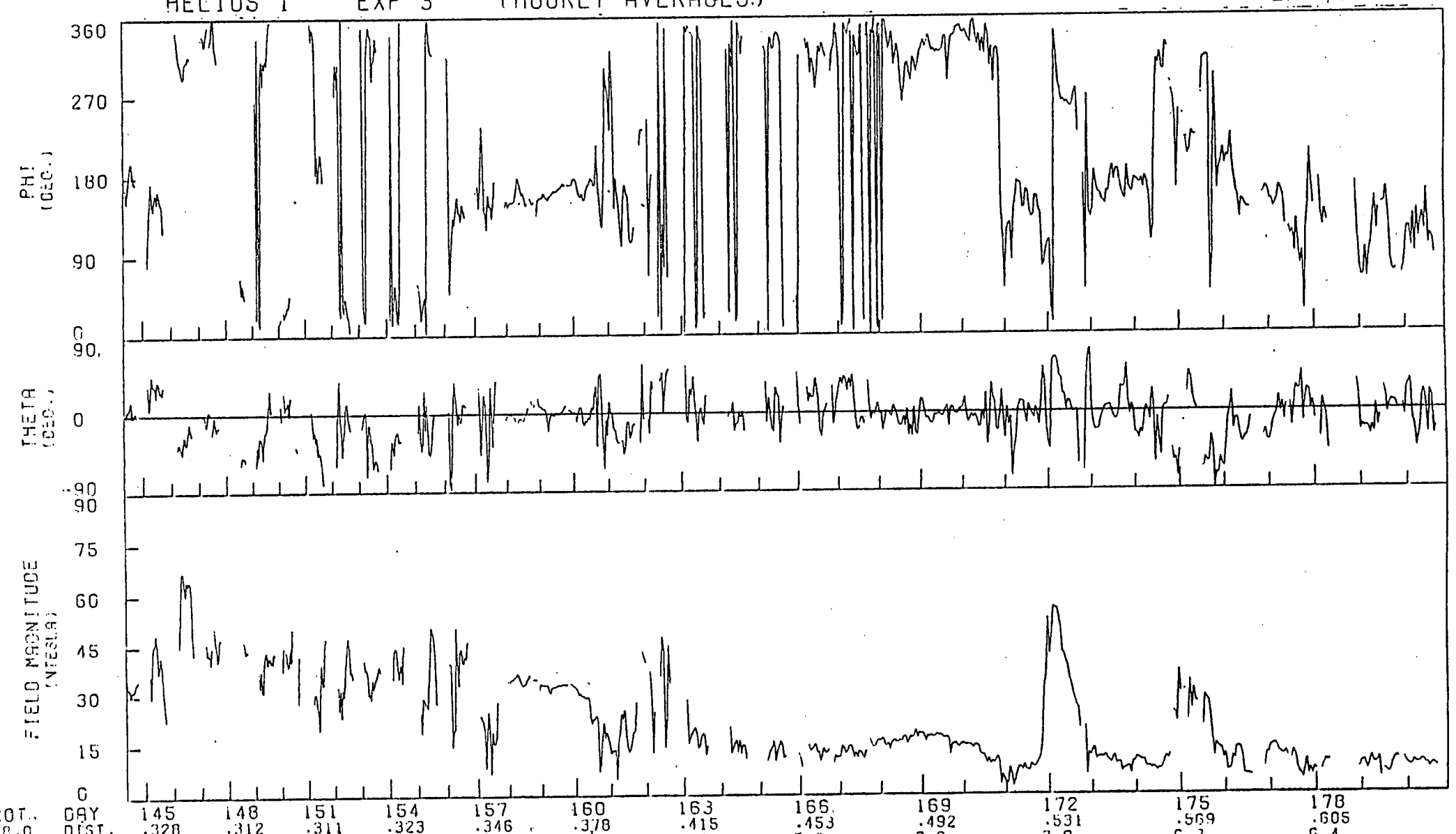

PHI
(DEG.)
360
270
180
90
0
THETA
(DEG.)
90
0
-90
FIELD MAGNITUDE
(NTESLA)
60
50
40
30
20
10
0
ROT.
62.6
TO
63.6
DAY.
DIST.
LAT.
LONG.
341
.455
7.2
269.6
344
.494
7.2
275.8
347
.533
7.0
280.4
350
.571
6.7
284.0
353
.607
6.4
286.8
356
.641
6.1
289.0
359
.674
5.7
290.6
362
.705
5.4
291.8
365
.735
5.1
292.7
3
.763
4.7
293.3

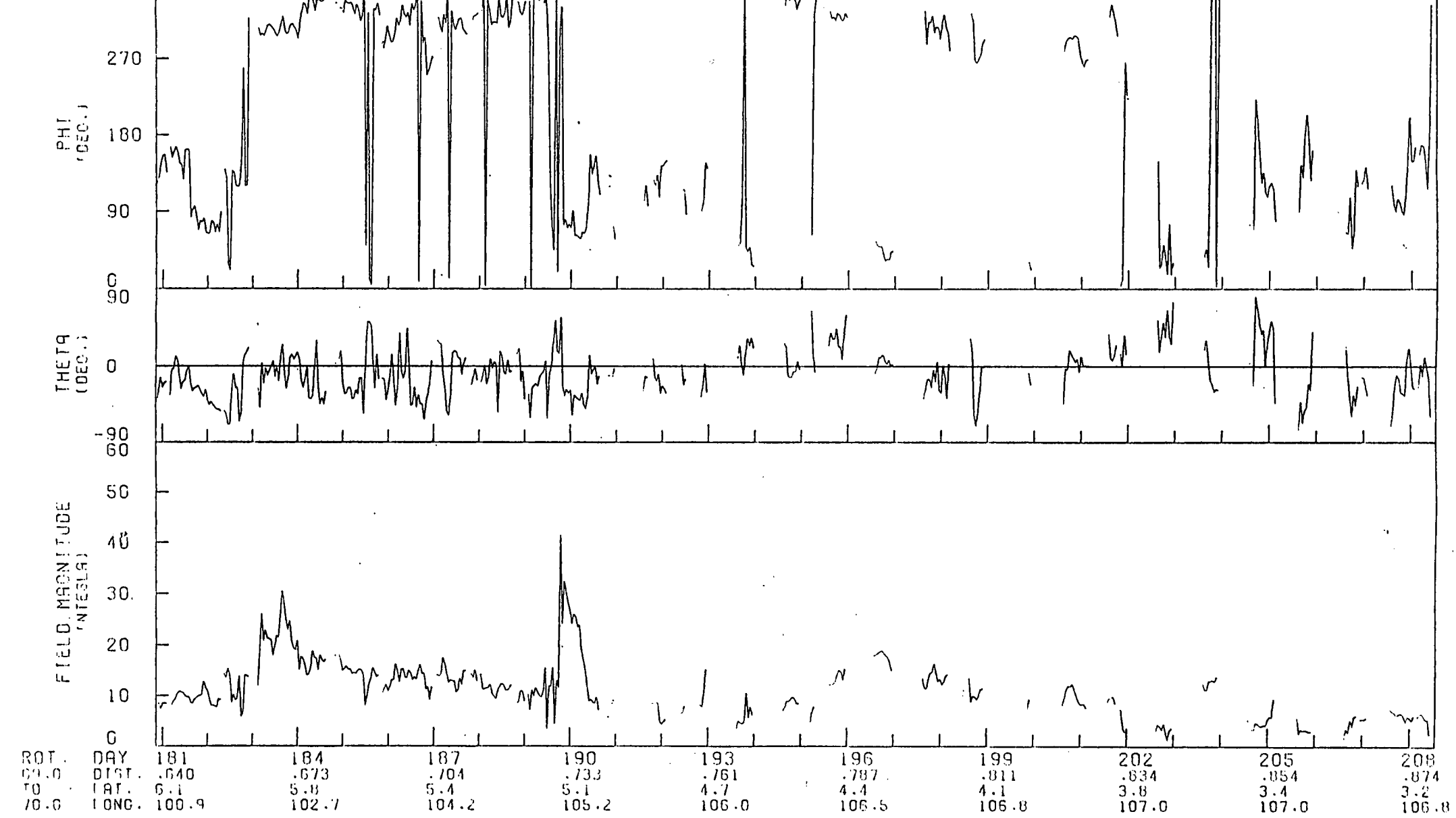

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1980.
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10.
5
0
ROT. DAY
5
8
11
14
17
20
23
26
29
DIST
780
805
828
849
868
887
903
918
931

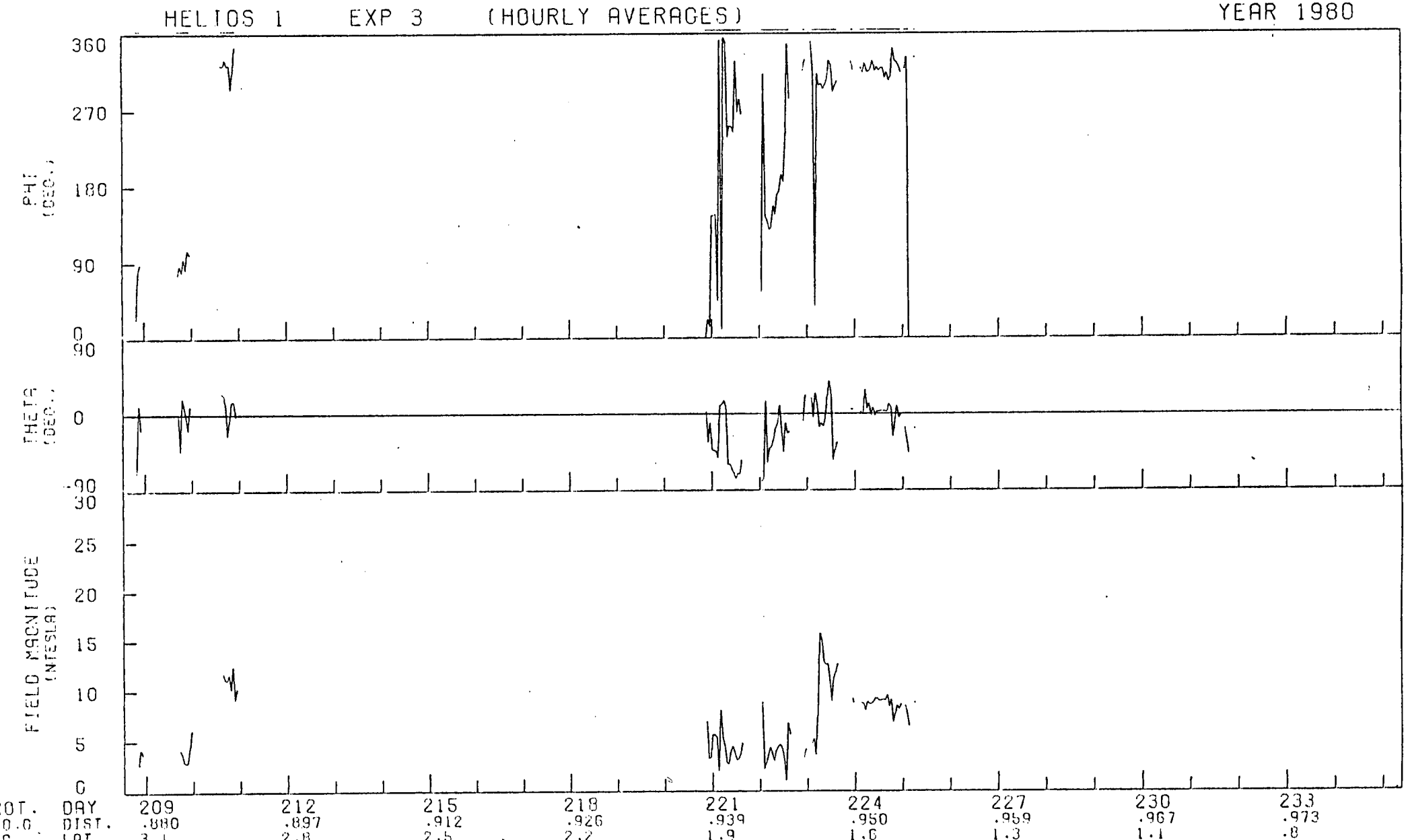

PHI
360
270
180
90
0
THETA
90
0
-90
FIELD MAGNITUDE
30
25
20
15
10
5
0
ROT. DAY 32 35 38 41 44 47 50 53 56
64.0 DIST. .943 .953 .962 .970 .975 .980 .983 .985 .985
TO LAT. 1.8 1.5 1.2 1.0 .7 .4 .2 -.1 -.4
66.0 LONG. 290.3 289.5 288.6 287.6 286.9 286.0 285.0 284.1 283.2

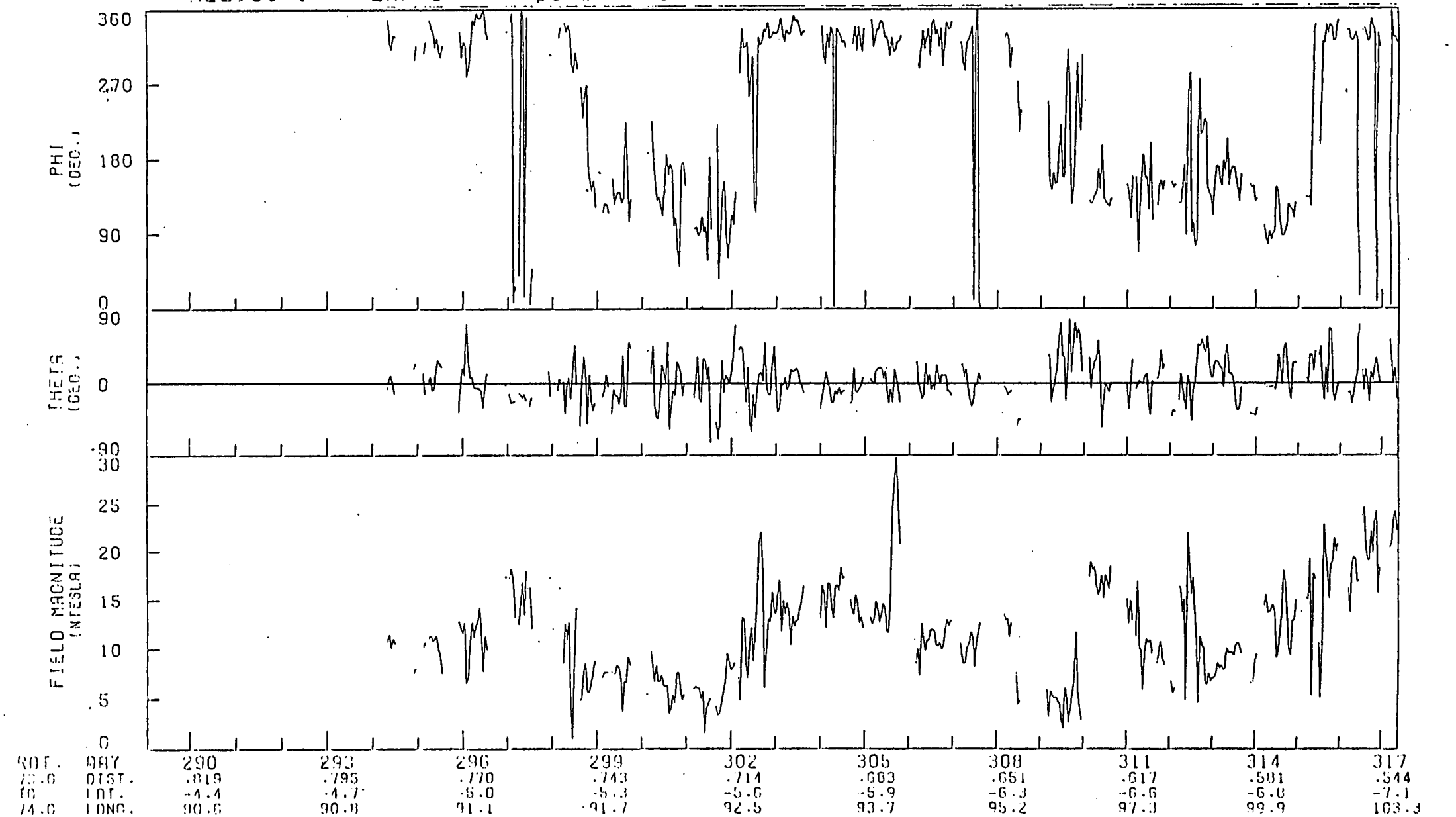

HELIOS 1 EXP 3 (HOURLY AVERAGES)
YEAR 1980
PHI (DEG.)
300
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NT)
30
25
20
15
10
5
0
ROT. DAY
DIST.
LAT.
86 .906 -3.1
89 .890 -3.3
92 .873 -3.6
95 .853 -3.9
98 .832 -4.2
101 .810 -4.5
104 .785 -4.8
107 .759 -5.1
110 .732 -5.4

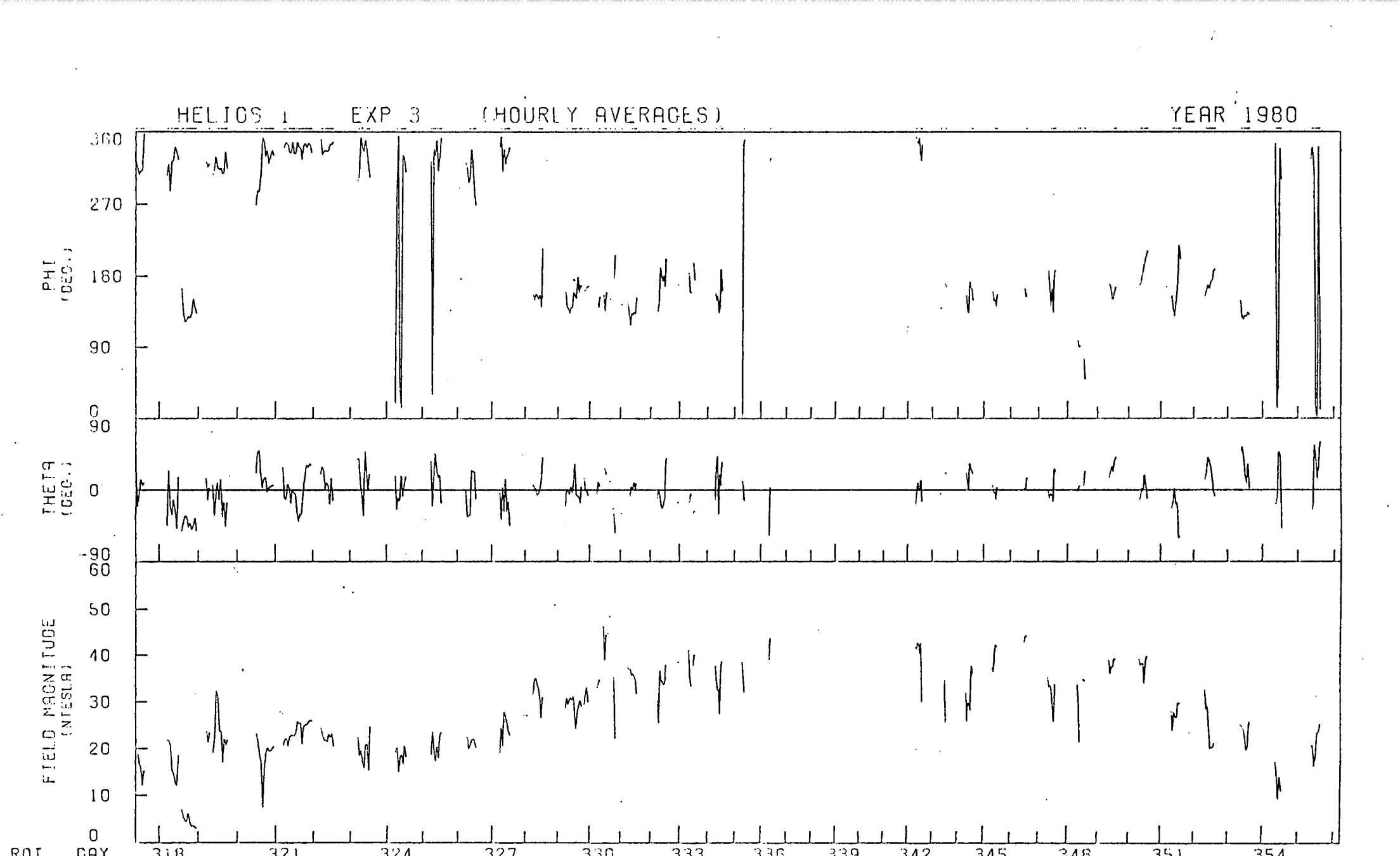

PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10.
0
ROT. 67.0 TG 68.0
DAY 113 116 119 122 125 128 131 134 137 140 143
DIST. .702 .671 .638 .603 .567 .529 .490 .451 .412 .376 .345
LAT. -5.8 -6.1 -6.4 -6.7 -6.9 -7.1 -7.2 -7.2 -6.9 -6.2 -4.9
LONG. 276.8 278.2 280.0 282.4 285.4 289.3 294.2 300.5 308.5 318.7 331.5

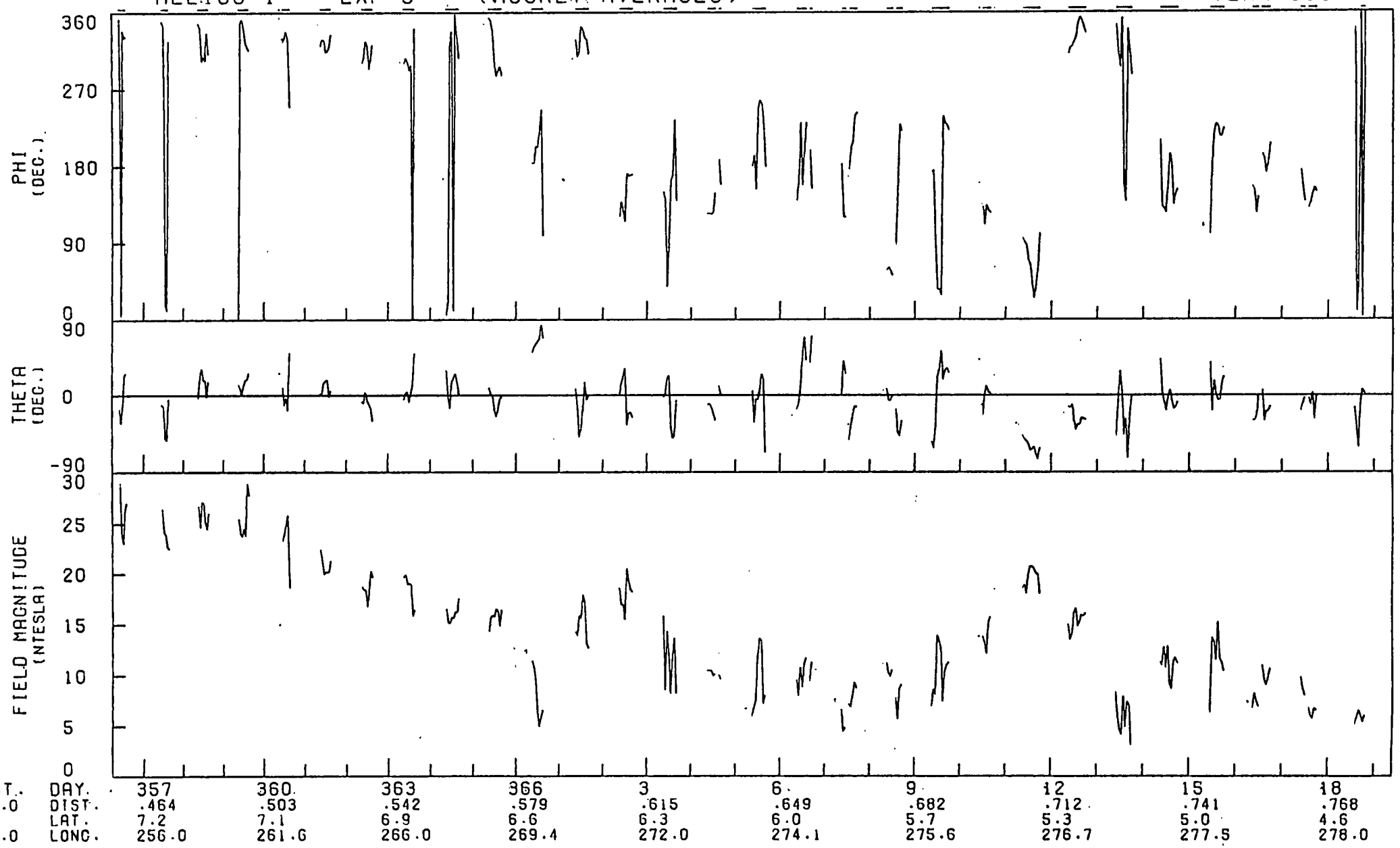

HELIOS 1 EXP 3 (HOURLY AVERAGES.)
YEAR 1980
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90.
0
-90
FIELD MAGNITUDE (NTESLA)
90
75
60
45
30
15
0
ROT. DAY
145
148
151
154
157
160
163
166.
169
172
175
178
DIST.
.328
.312
.311
.323
.346
.378
.415
.453
.492
.531
.569
.605

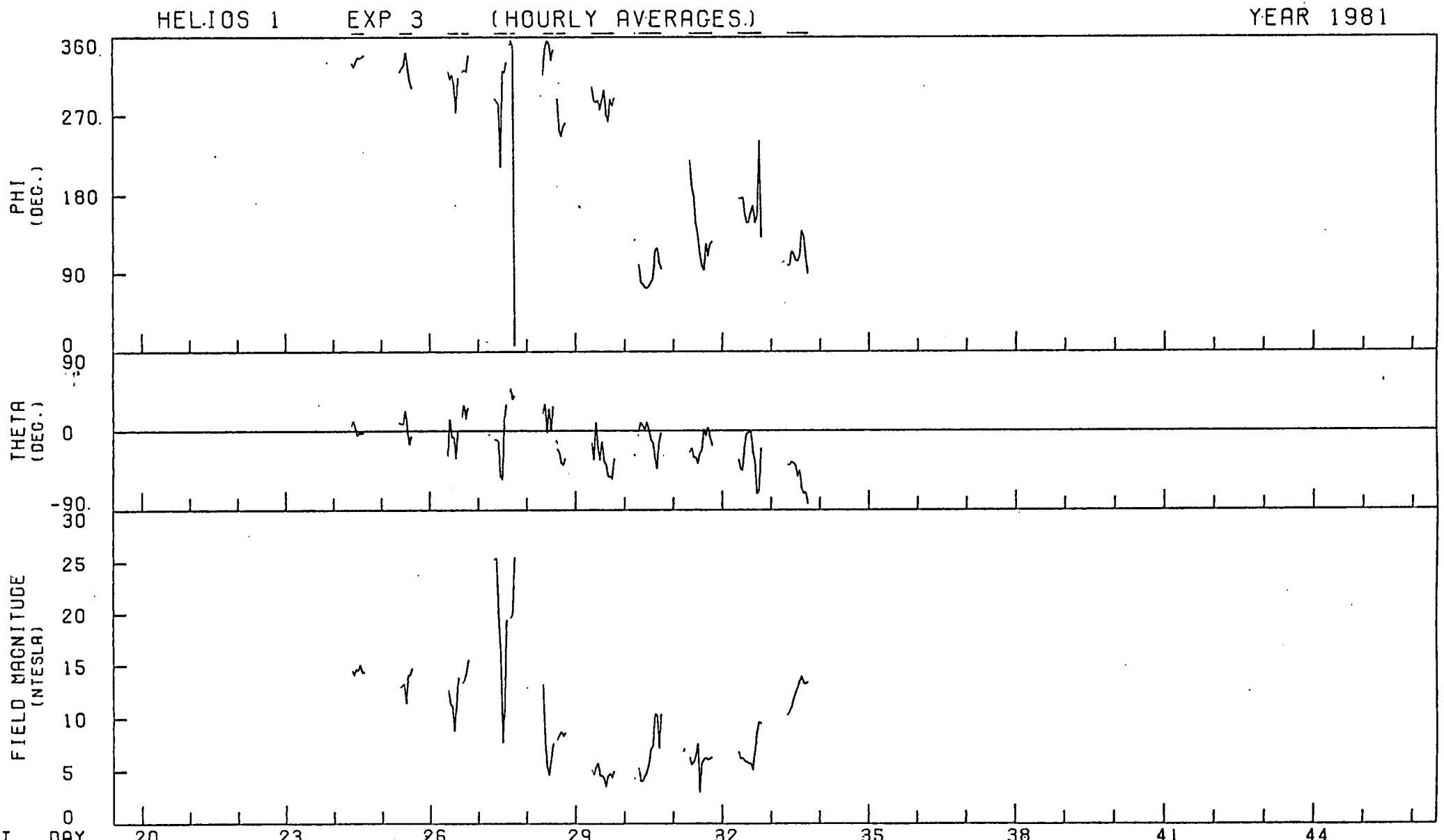

PHI (DEG.)
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY 181 184 187 190 193 196 199 202 205 208
DIST. .640 .673 .704 .733 .761 .787 .811 .834 .854 .874
LAT. 6.1 5.8 5.4 5.1 4.7 4.4 4.1 3.8 3.4 3.2
LONG. 100.9 102.7 104.2 105.2 106.0 106.5 106.8 107.0 107.0 106.8

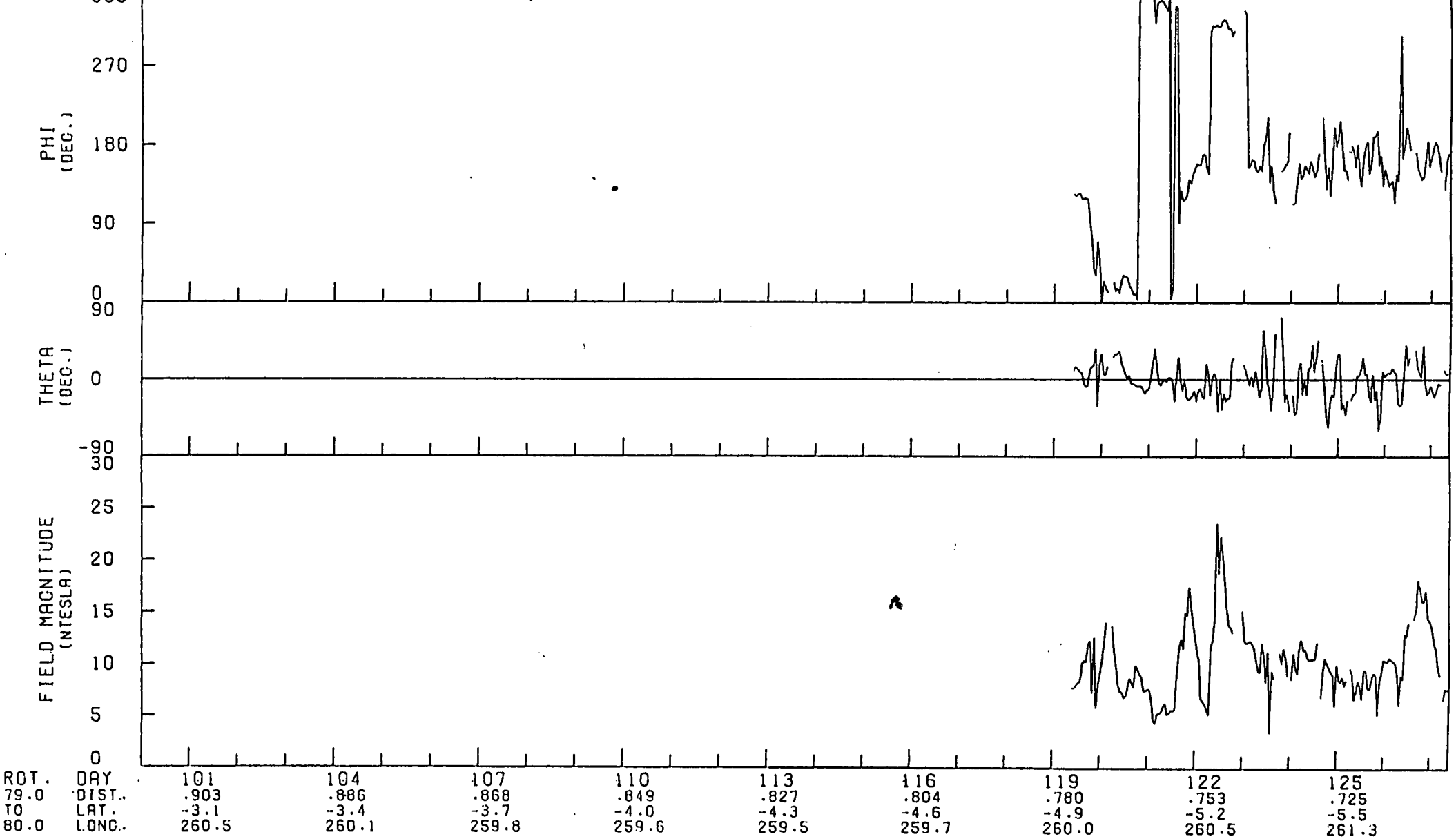

HELIOS 1 EXP 3 (HOURLY AVERAGES)
YEAR 1980
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
/0.0 DIST.
209 .880
212 .897
215 .912
218 .926
221 .939
224 .950
227 .959
230 .967
233 .973
1.9
1.6
1.3
1.1
.8

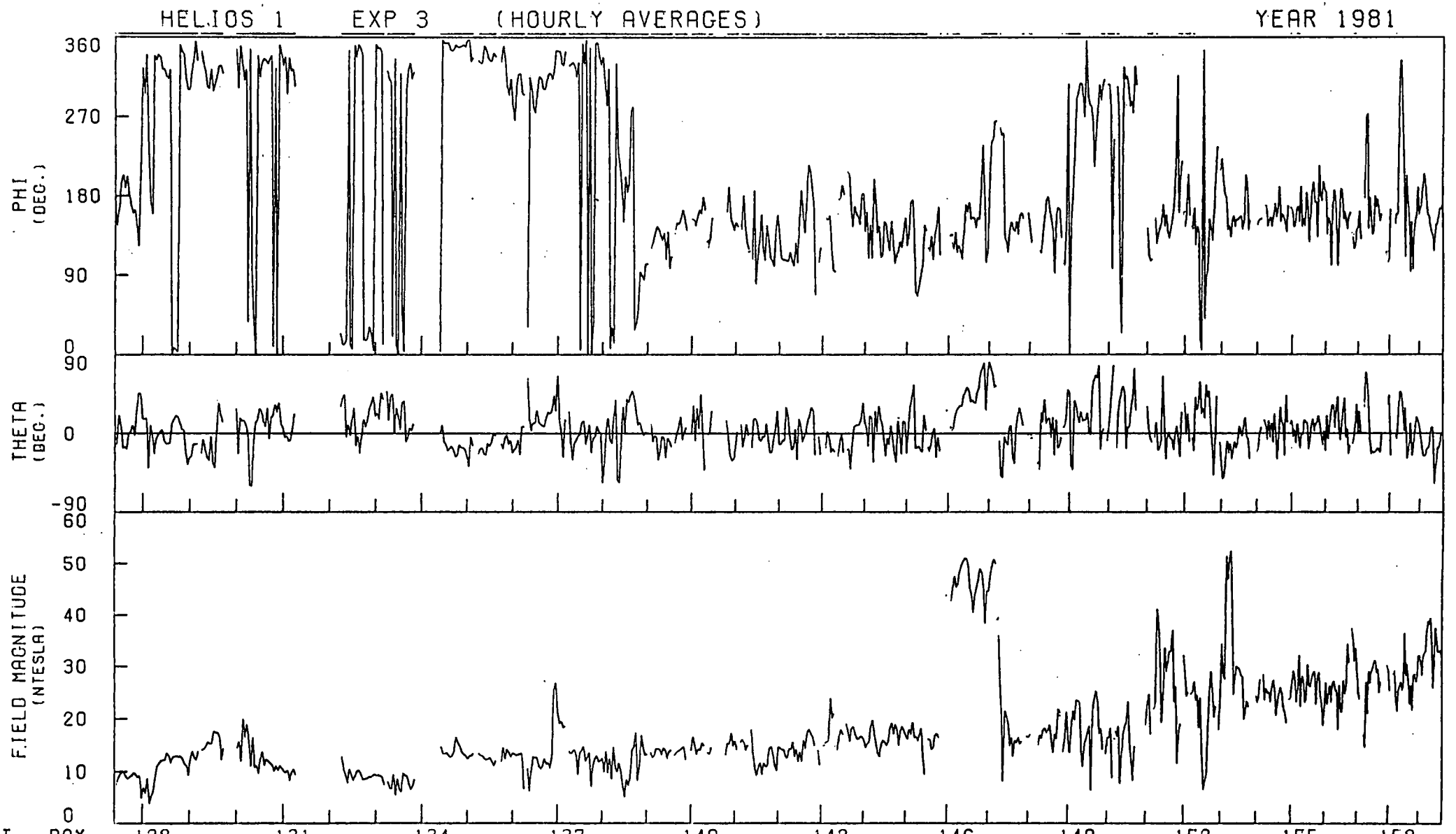

PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 75.6 78.6 74.6
DAY 290 293 296 299 302 305 308 311 314 317
DIST. .819 .795 .770 .743 .714 .683 .651 .617 .581 .544
LAT. -4.4 -4.7 -5.0 -5.3 -5.6 -5.9 -6.3 -6.6 -6.8 -7.1
LONG. 90.6 90.8 91.1 91.7 92.5 93.7 95.2 97.3 99.9 103.3

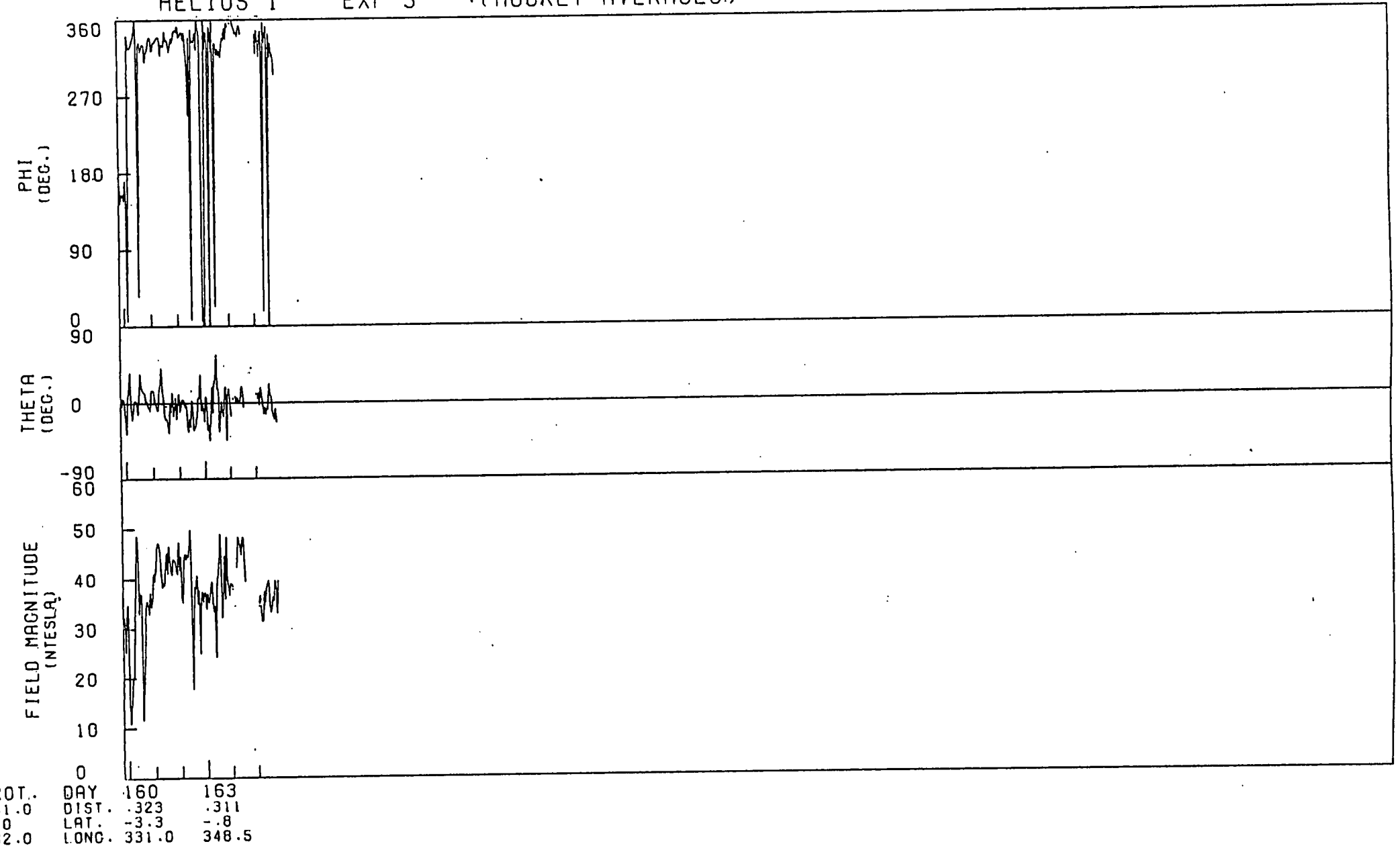

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1980
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT DAY
318
321
324
327
330
333
336
339
342
345
348
351
354

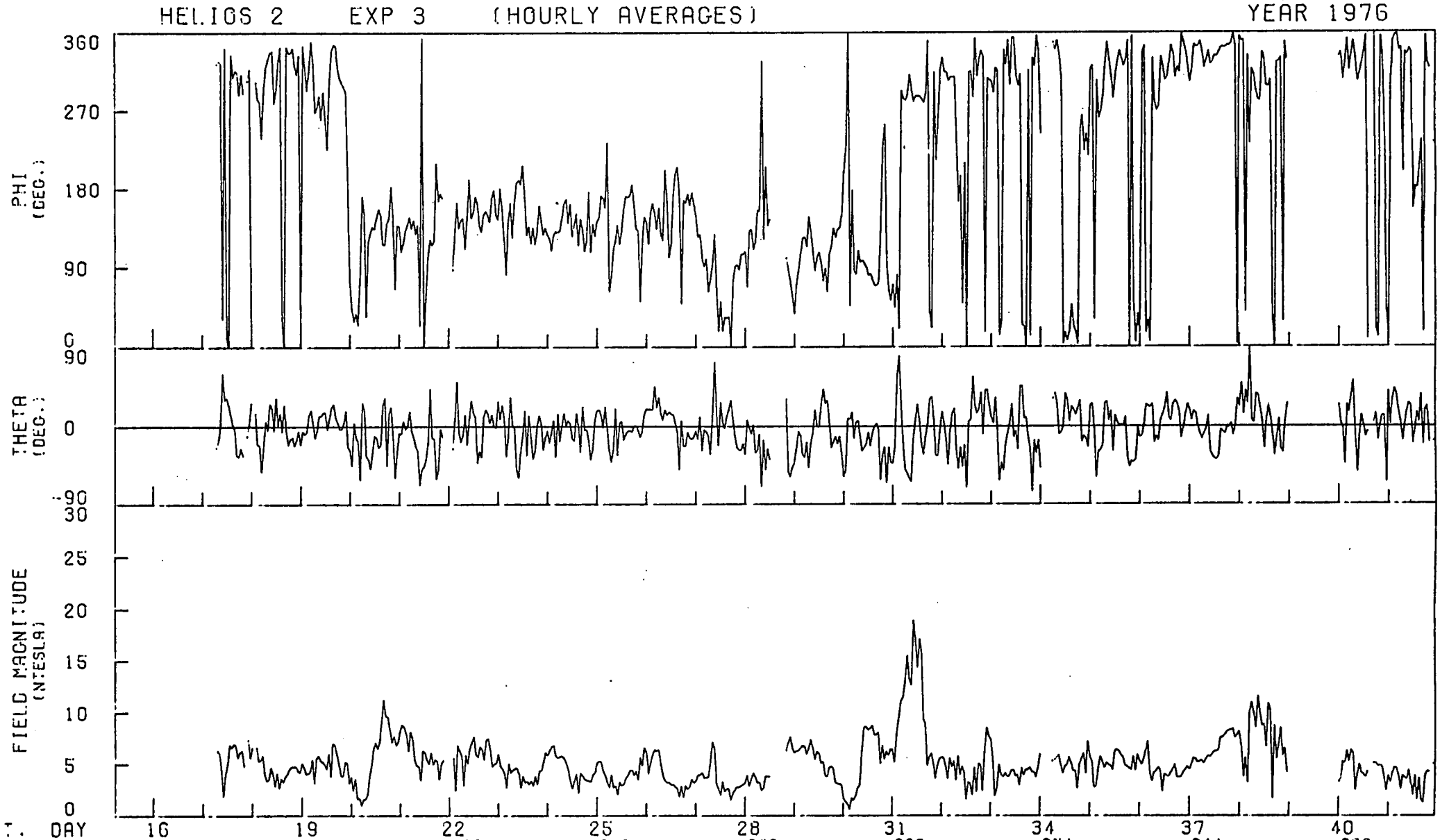

PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 75.0 TO 76.0
DAY. 357 360 363 366 3 6 9 12 15 18
DIST. .464 .503 .542 .579 .615 .649 .682 .712 .741 .768
LAT. 7.2 7.1 6.9 6.6 6.3 6.0 5.7 5.3 5.0 4.6
LONG. 256.0 261.6 266.0 269.4 272.0 274.1 275.6 276.7 277.5 278.0

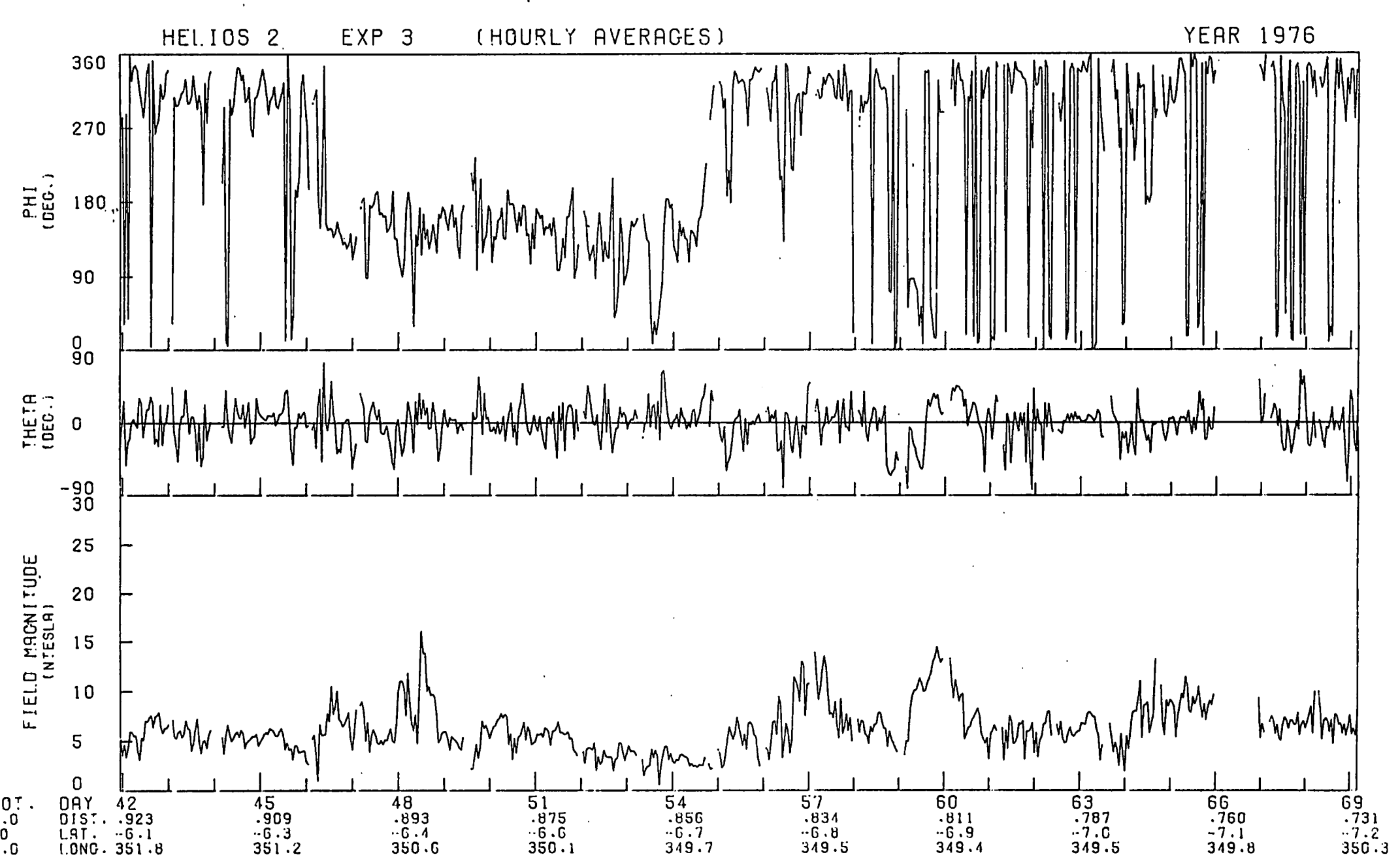

HELIOS 1 EXP 3 (HOURLY AVERAGES.) YEAR 1981
PHI (DEG.)
360.
270.
180
90
0
THETA (DEG.)
90
0
-90.
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT DAY
20
23
26
29
32
35
38
41
44

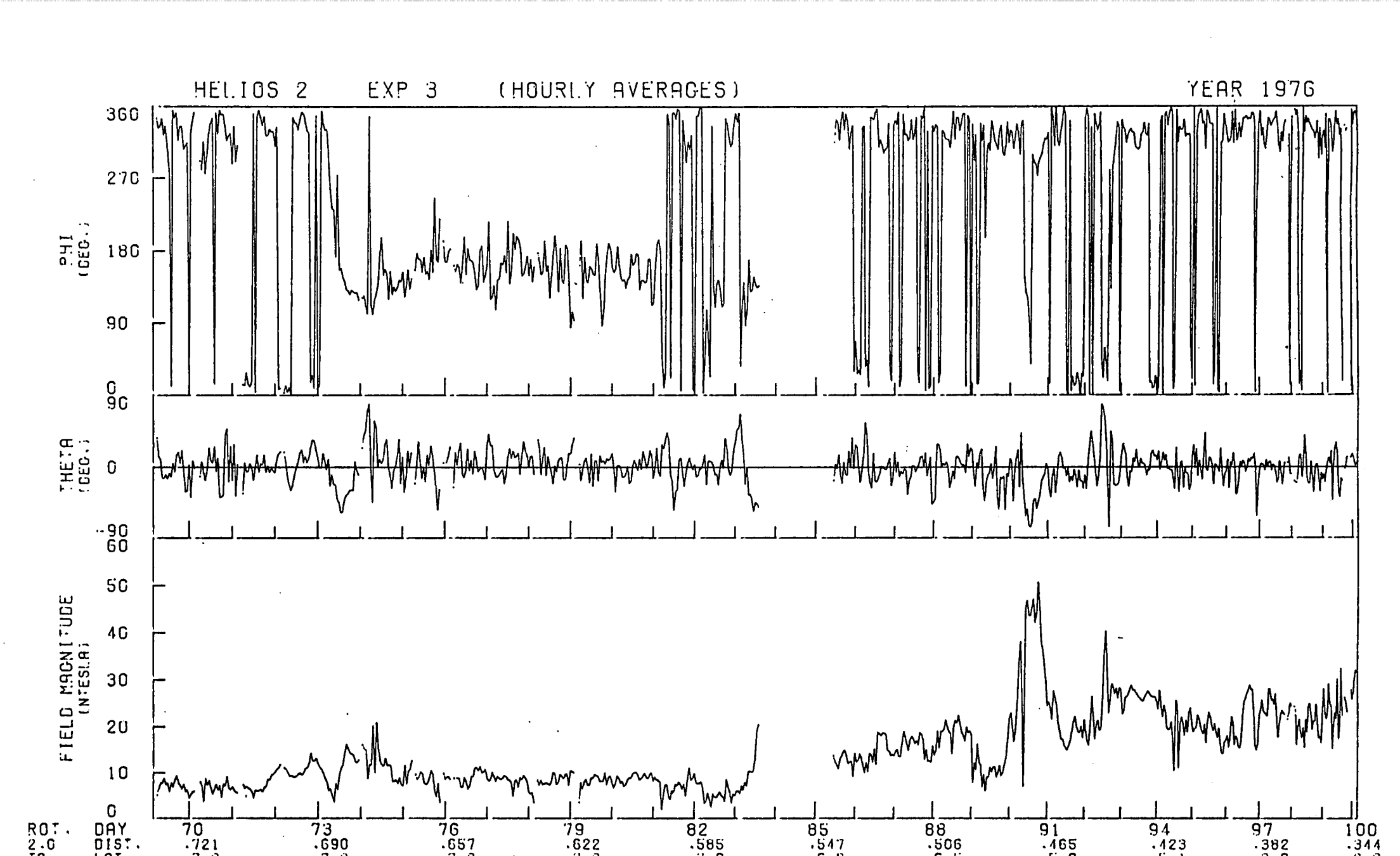

PHI (DEG.)
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 79.0 TO 80.0
DAY 101 104 107 110 113 116 119 122 125
DIST.. .903 .886 .868 .849 .827 .804 .780 .753 .725
LAT. -3.1 -3.4 -3.7 -4.0 -4.3 -4.6 -4.9 -5.2 -5.5
LONG.. 260.5 260.1 259.8 259.6 259.5 259.7 260.0 260.5 261.3

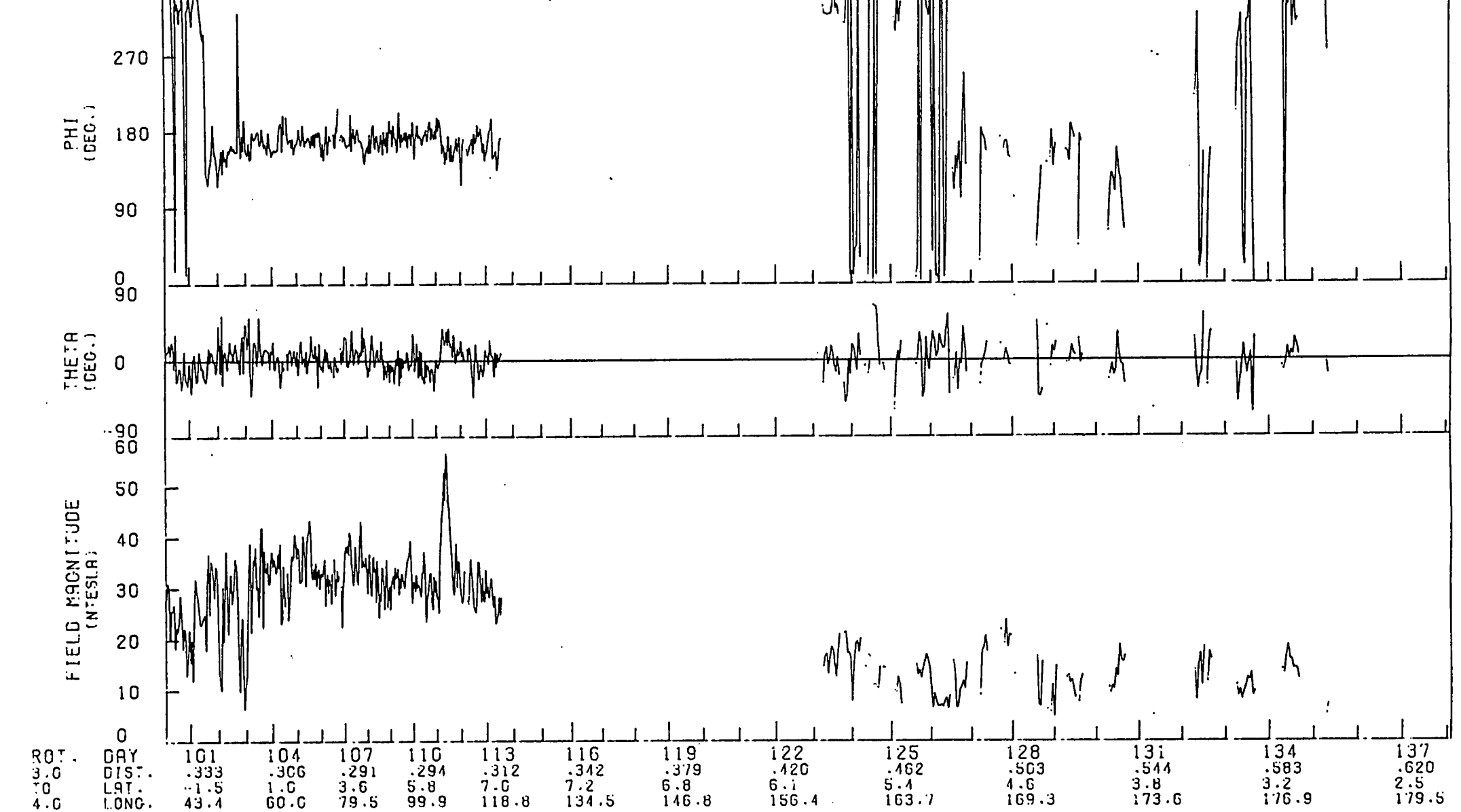

HELIOS 1 EXP 3 (HOURLY AVERAGES) YEAR 1981
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0

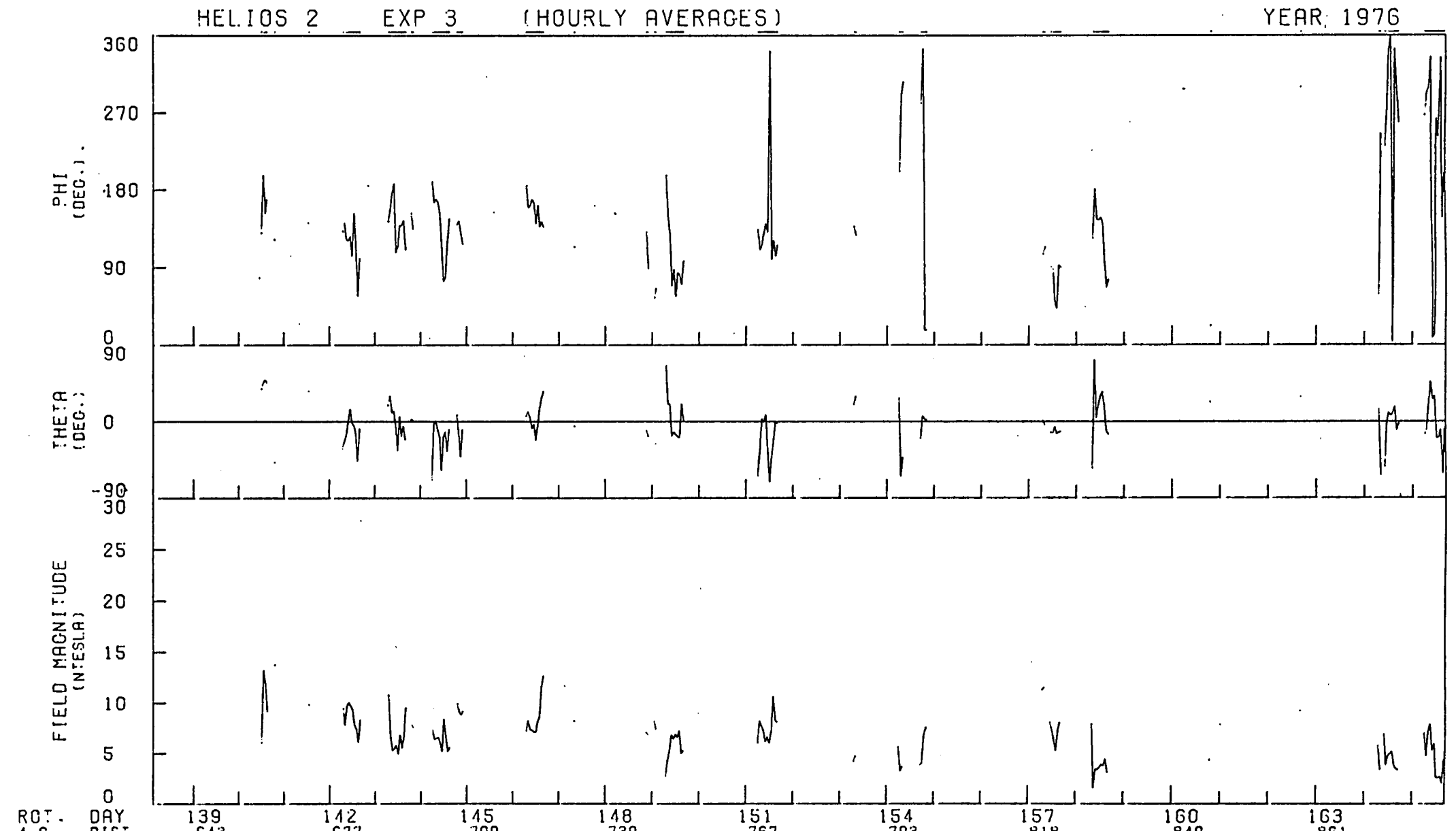

HELIOS 1 EXP 5 (1-HOUR AVERAGES)
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY 160 163
81.0 DIST. .323 .311
TO LAT. -3.3 -.8
82.0 LONG. 331.0 348.5

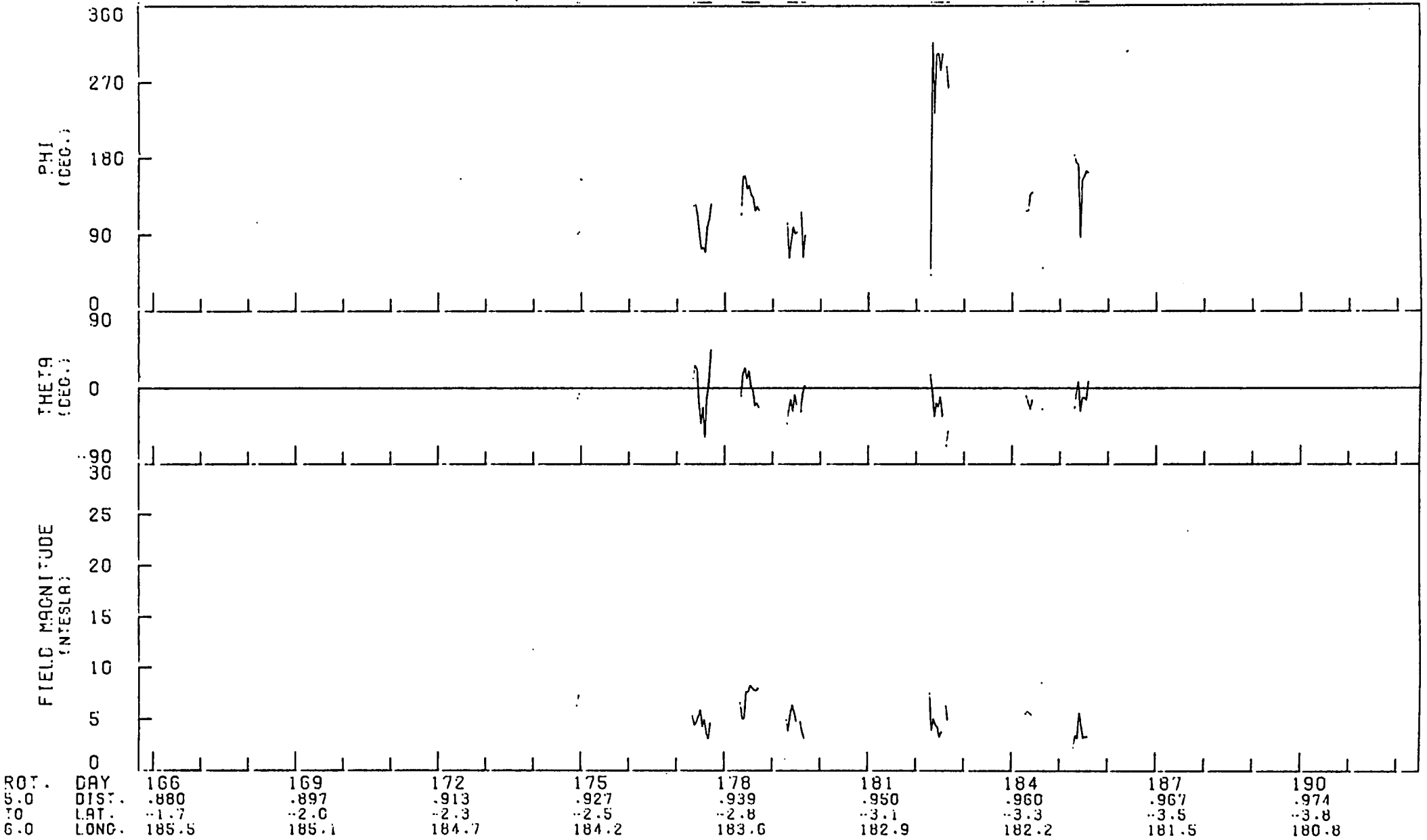

HELIOS 2 EXP 3 (HOURLY AVERAGES)
YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
16
19
22
25
28
31
34
37
40


HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
DAY 42 45 48 51 54 57 60 63 66 69
DIST. .923 .909 .893 .875 .856 .834 .811 .787 .760 .731
LAT. -6.1 -6.3 -6.4 -6.6 -6.7 -6.8 -6.9 -7.0 -7.1 -7.2
LONG. 351.8 351.2 350.6 350.1 349.7 349.5 349.4 349.5 349.8 350.3

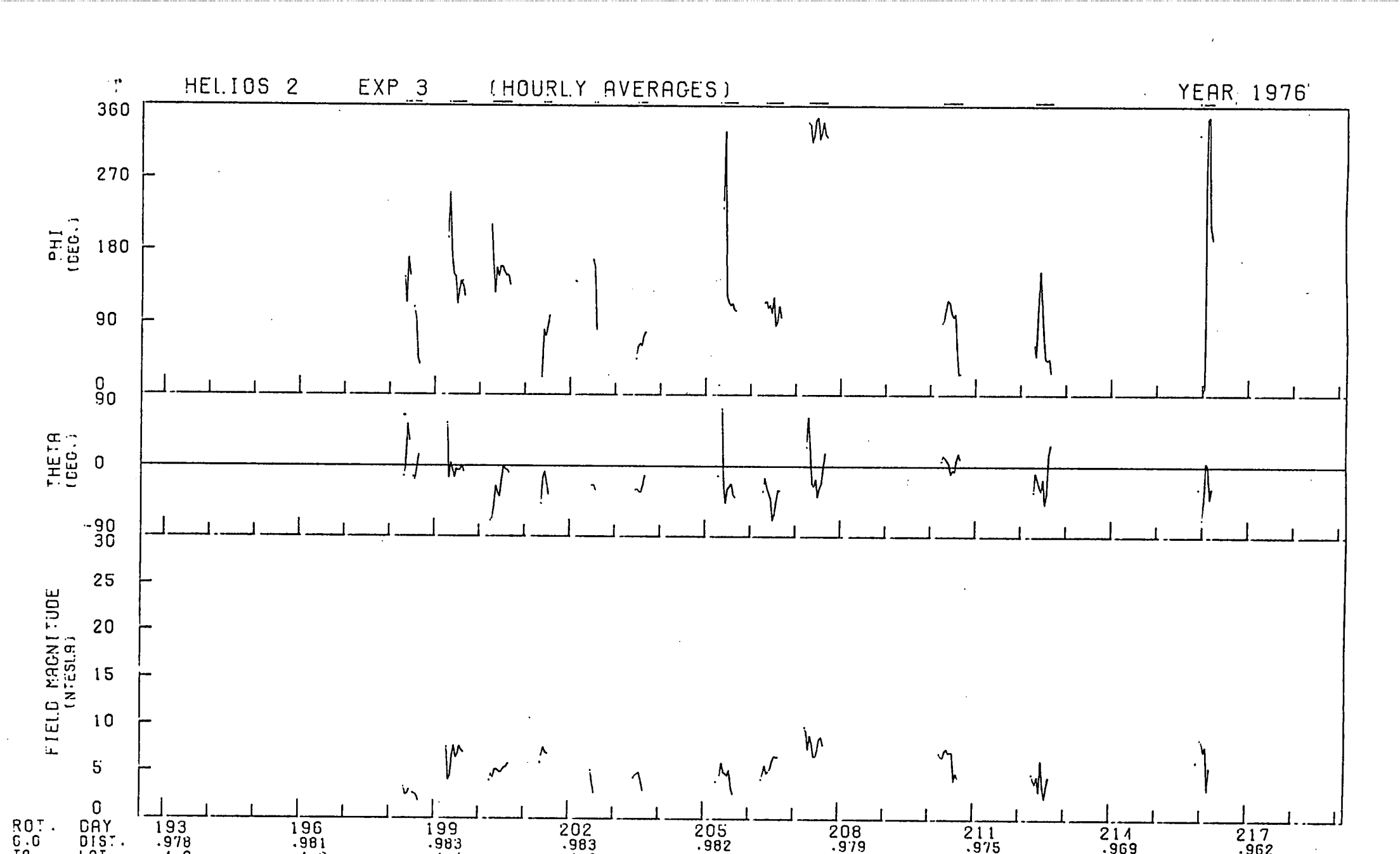

HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY
2.0 DIST.
70 73 76 79 82 85 88 91 94 97 100
.721 .690 .657 .622 .585 .547 .506 .465 .423 .382 .344

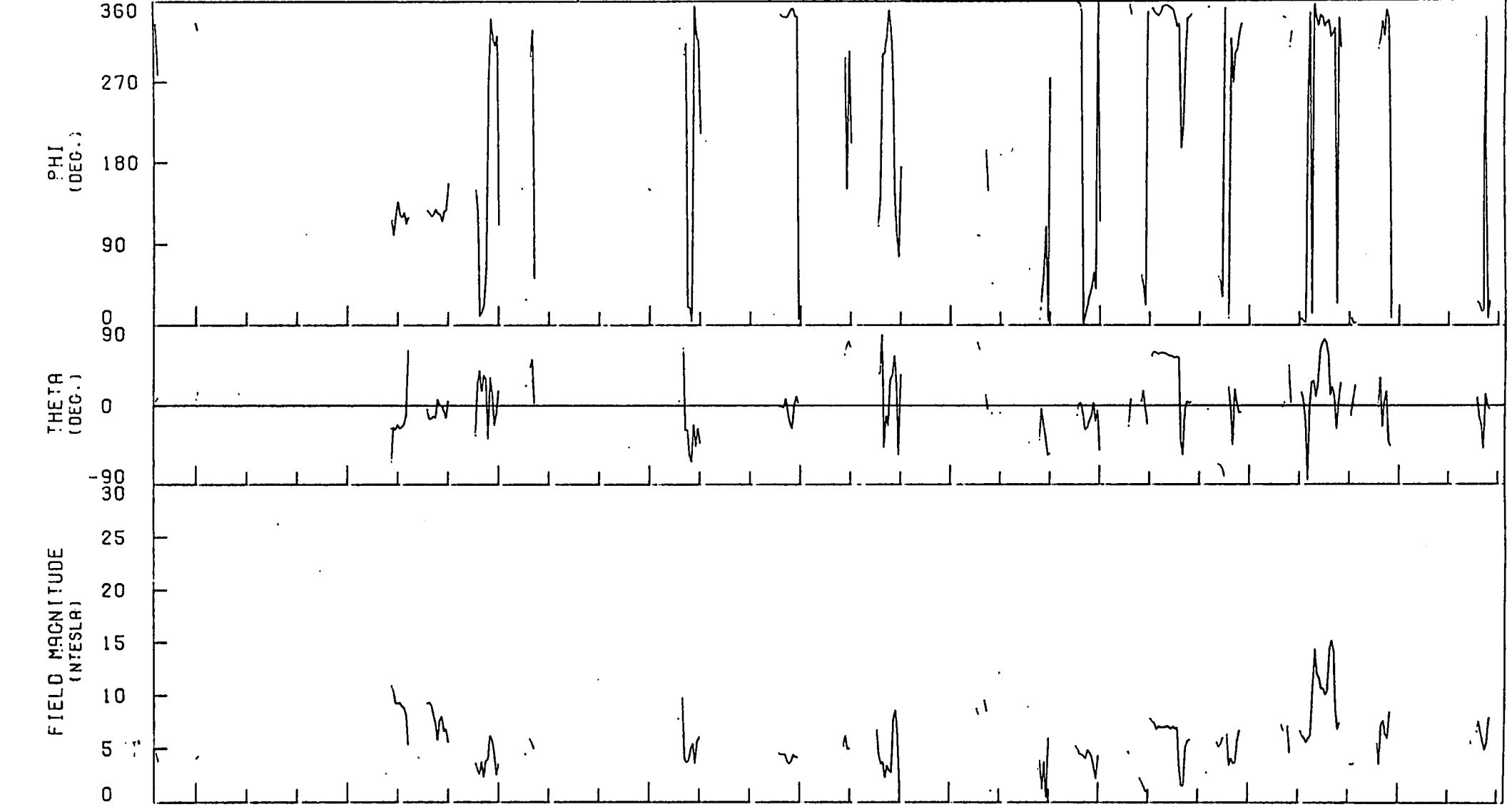

PHI (DEG.)
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY 101 104 107 110 113 116 119 122 125 128 131 134 137
3.0 DIST. .333 .306 .291 .294 .312 .342 .379 .420 .462 .503 .544 .583 .620
TO LAT. -1.5 1.0 3.6 5.8 7.0 7.2 6.8 6.1 5.4 4.6 3.8 3.2 2.5
4.0 LONG. 43.4 60.0 79.5 99.9 118.8 134.5 146.8 156.4 163.7 169.3 173.6 176.9 179.5


HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
139
142
145
148
151
154
157
160
163

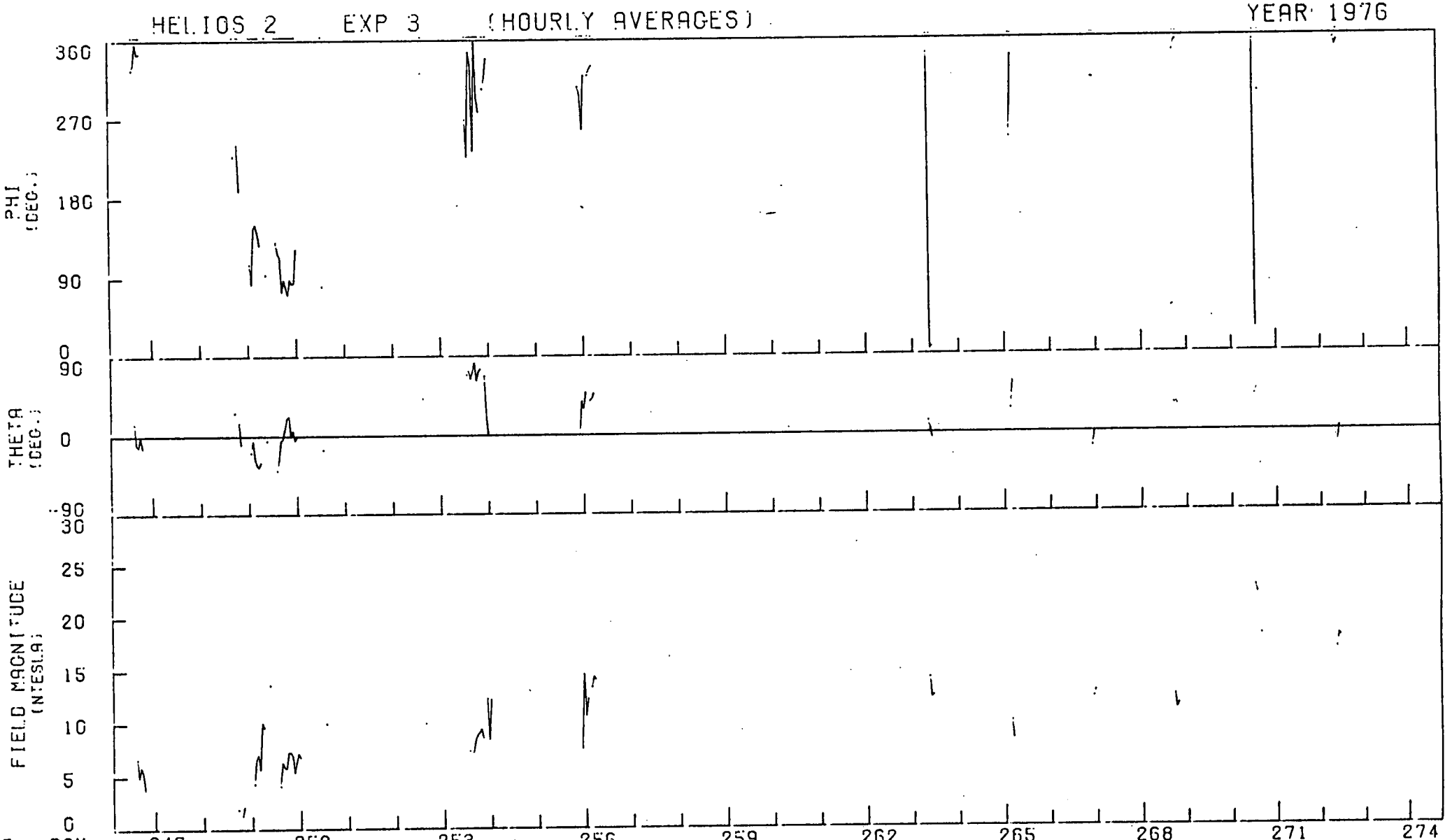


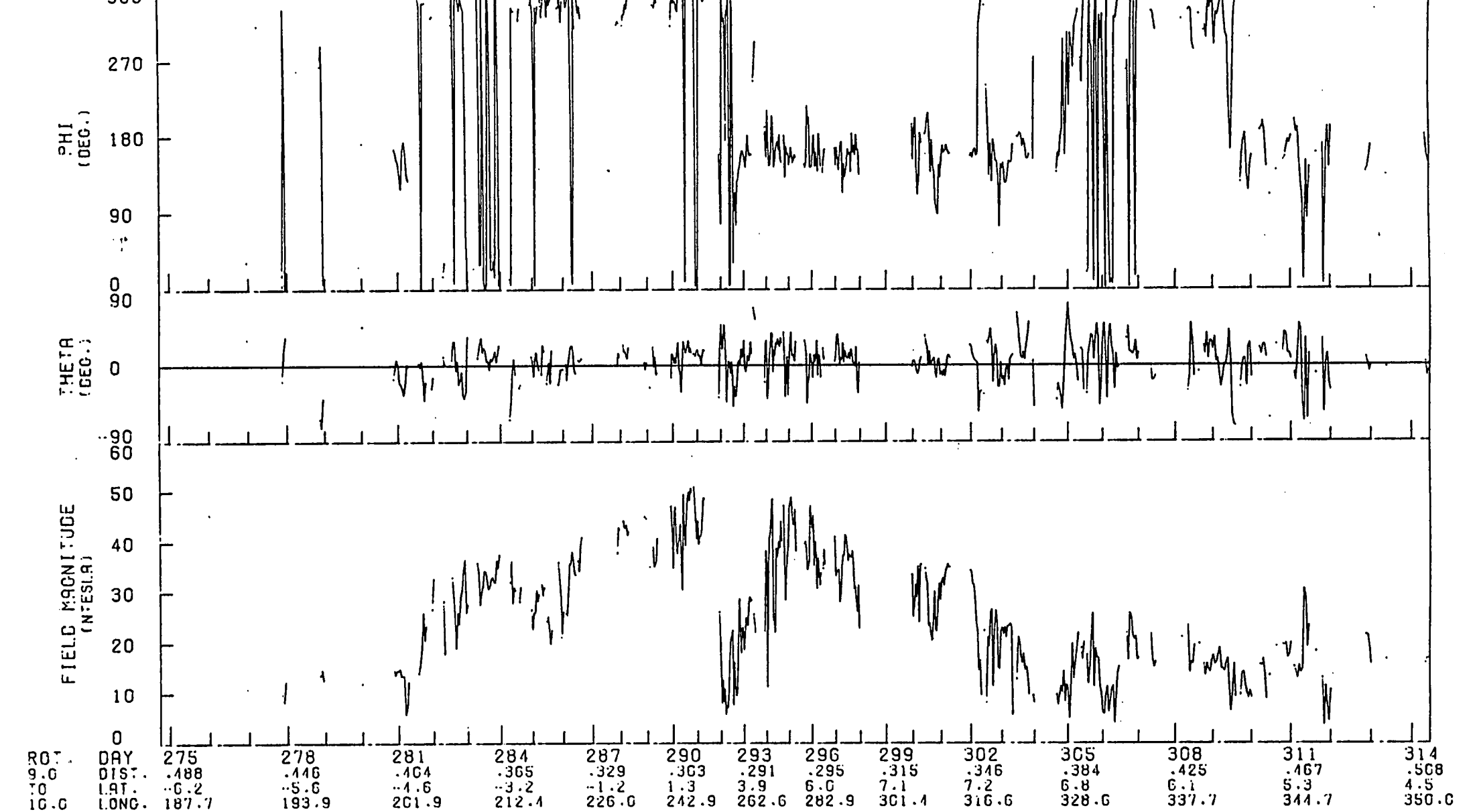
ROT.	DAY	166	169	172	175	178	181	184	187	190
5.0	DIST.	.880	.897	.913	.927	.939	.950	.960	.967	.974
TO	LAT.	-1.7	-2.0	-2.3	-2.5	-2.8	-3.1	-3.3	-3.5	-3.8
6.0	LONG.	185.5	185.1	184.7	184.2	183.6	182.9	182.2	181.5	180.8

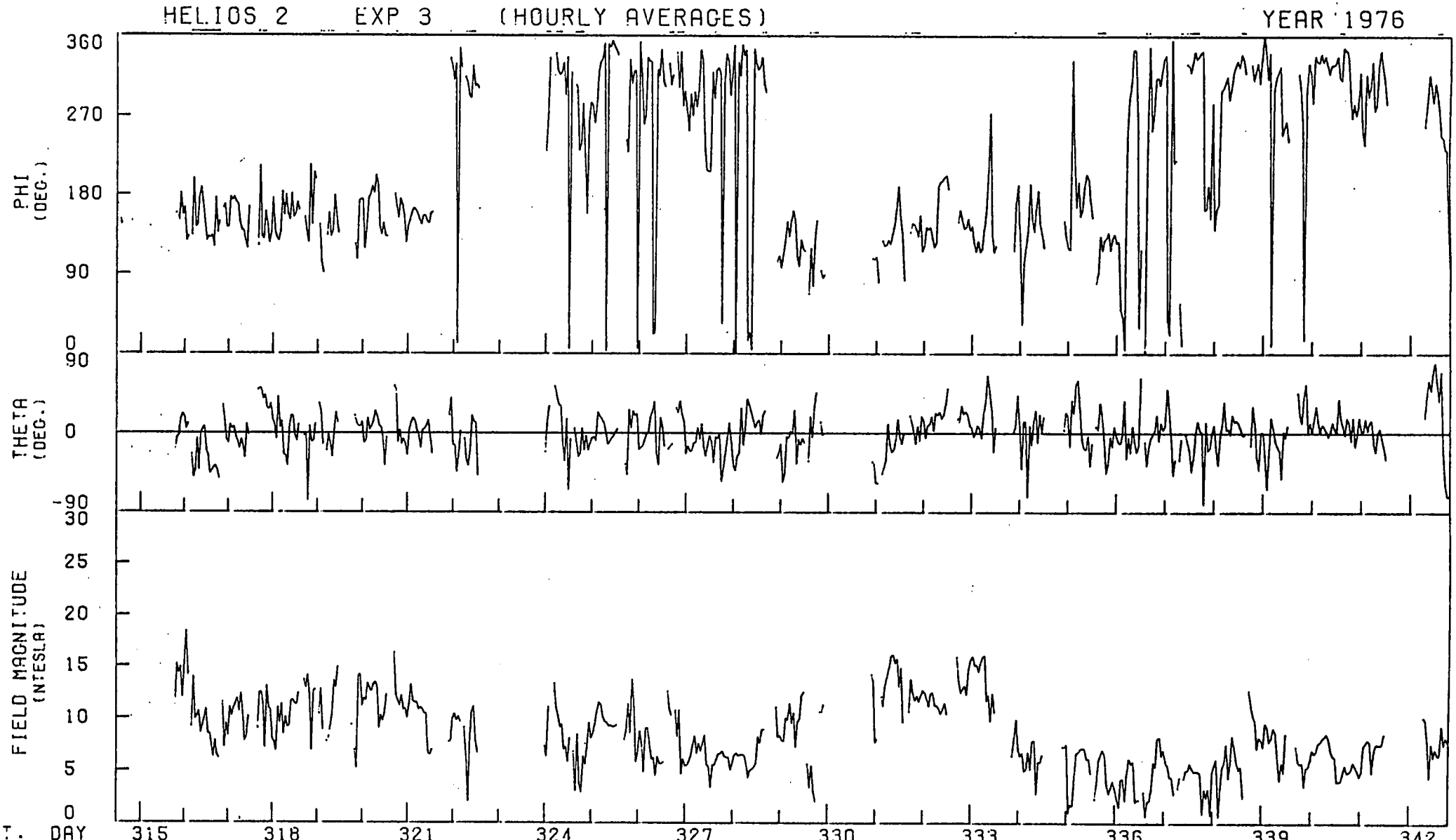

HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY 193 196 199 202 205 208 211 214 217
C.G DIST. .978 .981 .983 .983 .982 .979 .975 .969 .962

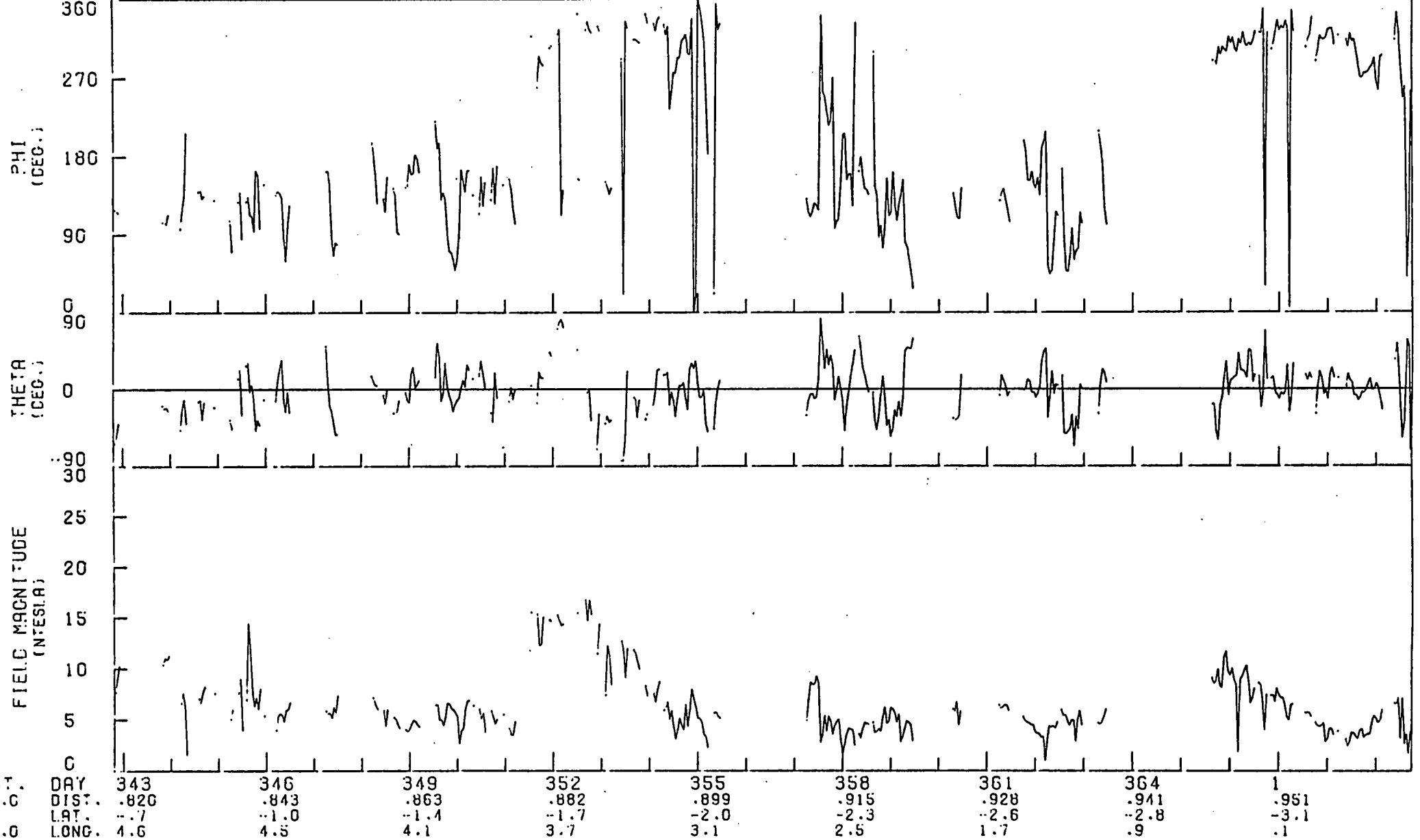


ROT.	DAY	220	223	226	229	232	235	238	241	244
7.0	DIST.	.953	.943	.931	.917	.902	.885	.866	.846	.824
TO	LAT.	-5.7	-5.9	-6.0	-6.2	-6.4	-6.5	-6.6	-6.8	-6.9
8.0	LONG.	172.9	172.2	171.6	171.0	170.5	170.1	169.8	169.6	169.6

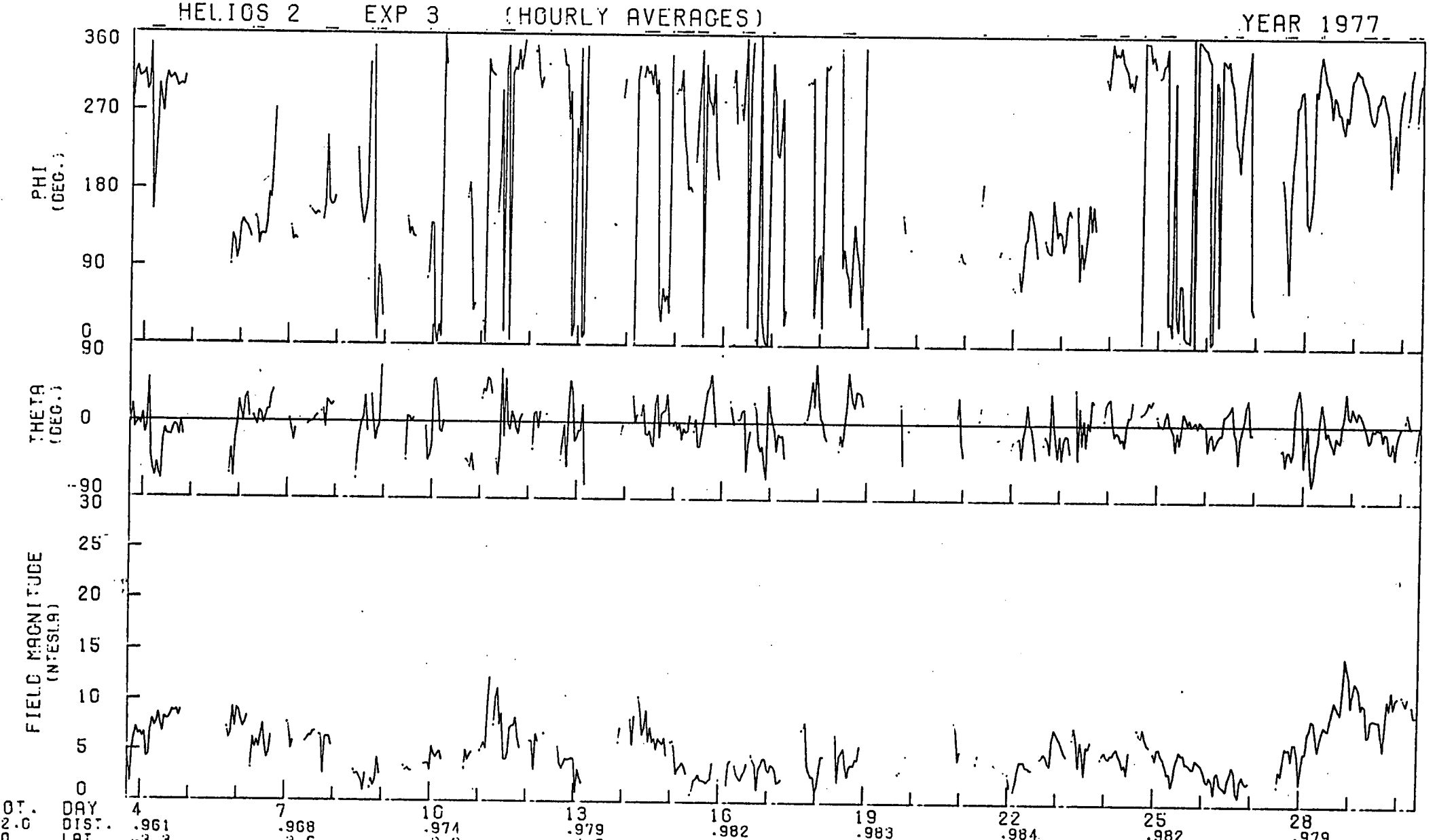

HELIOS 2 EXP 3 (HOURLY AVERAGES)
YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
259
262
265
268
271
274

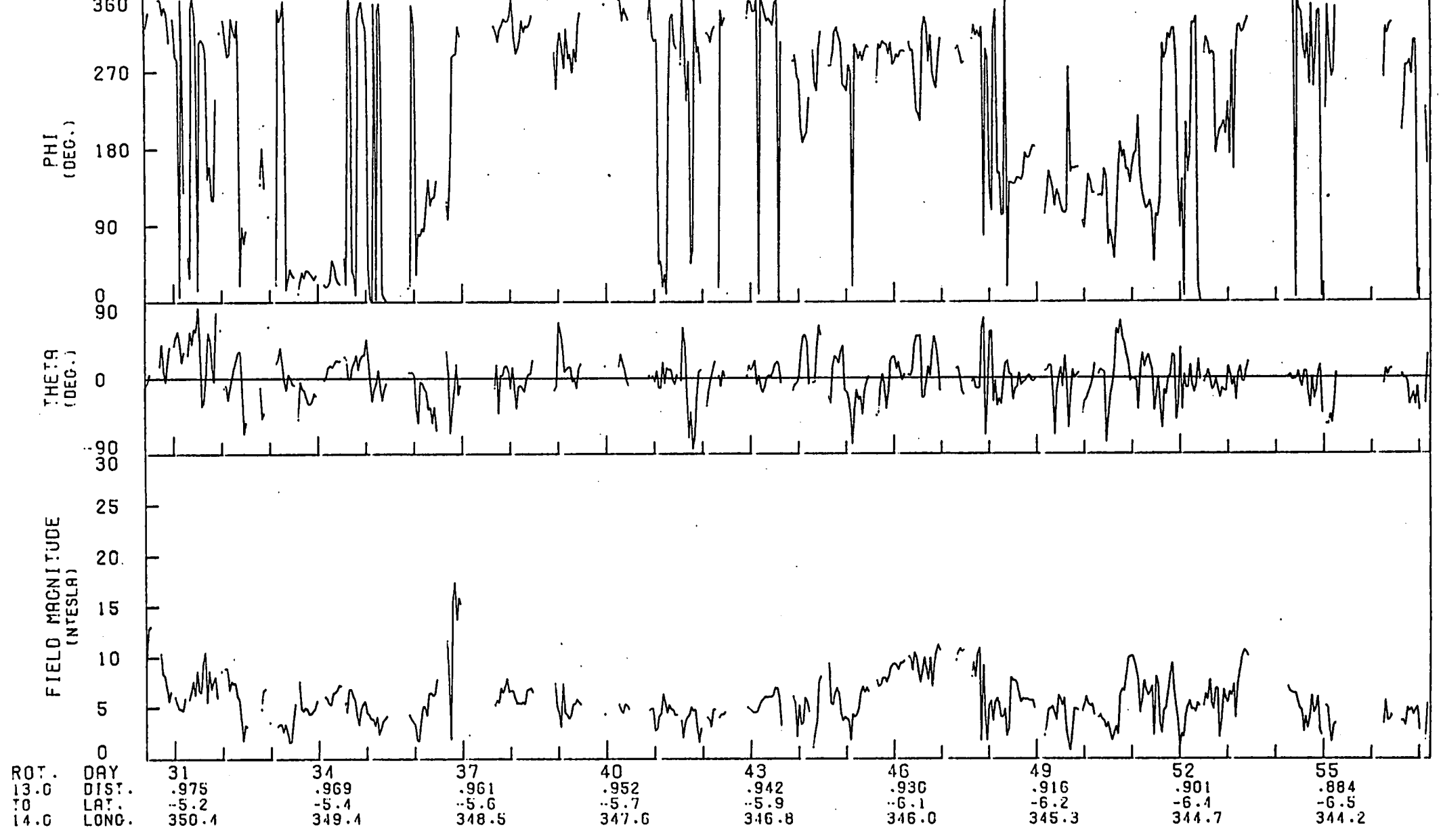

PHI (DEG.)
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY 275 278 281 284 287 290 293 296 299 302 305 308 311 314
9.0 DIST. .488 .446 .404 .365 .329 .303 .291 .295 .315 .346 .384 .425 .467 .508
TO LAT. -6.2 -5.6 -4.6 -3.2 -1.2 1.3 3.9 6.0 7.1 7.2 6.8 6.1 5.3 4.5
10.0 LONG. 187.7 193.9 201.9 212.4 226.0 242.9 262.6 282.9 301.4 316.6 328.6 337.7 344.7 350.0

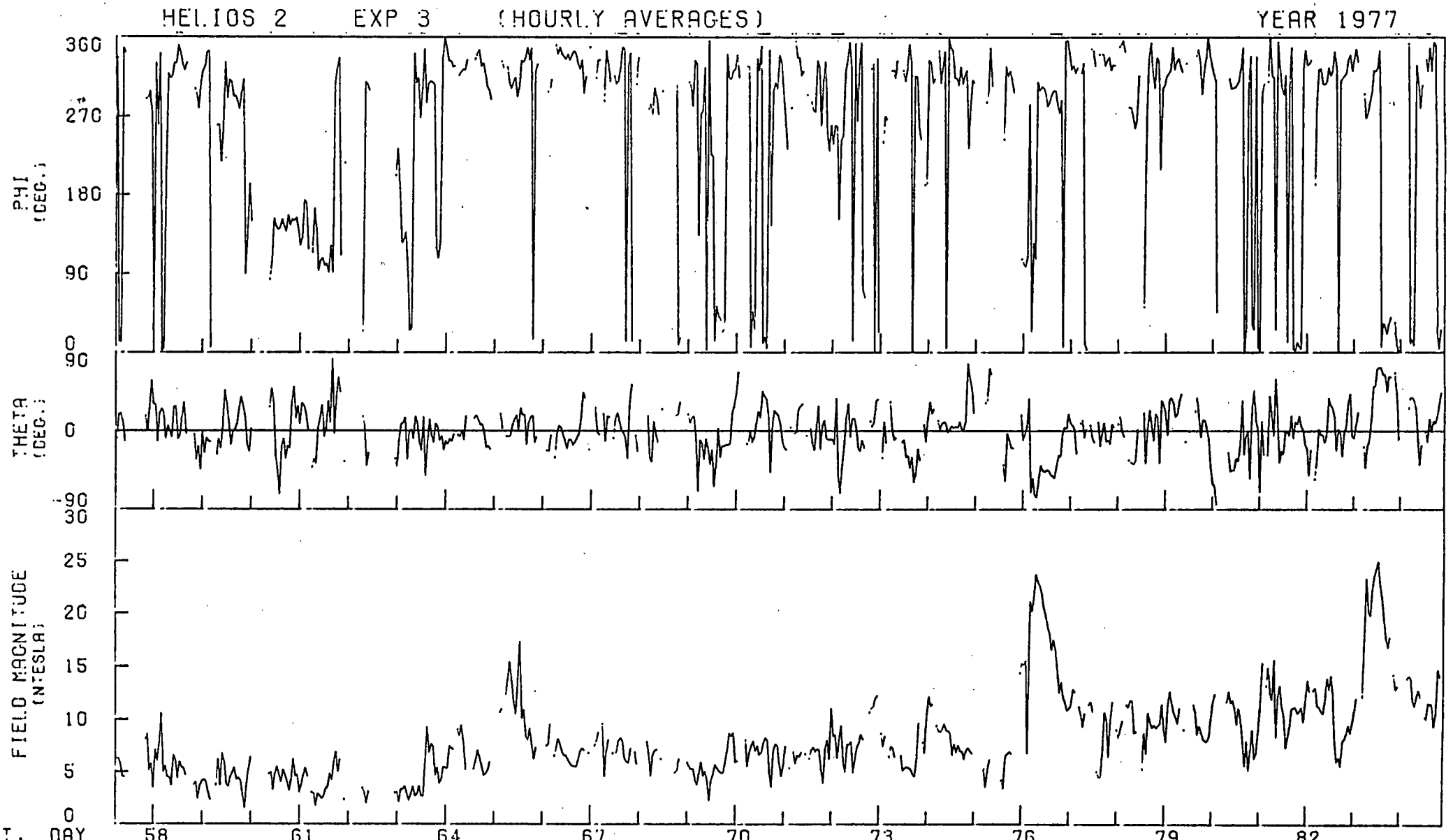

HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1976
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
315
318
321
324
327
330
333
336
339
342

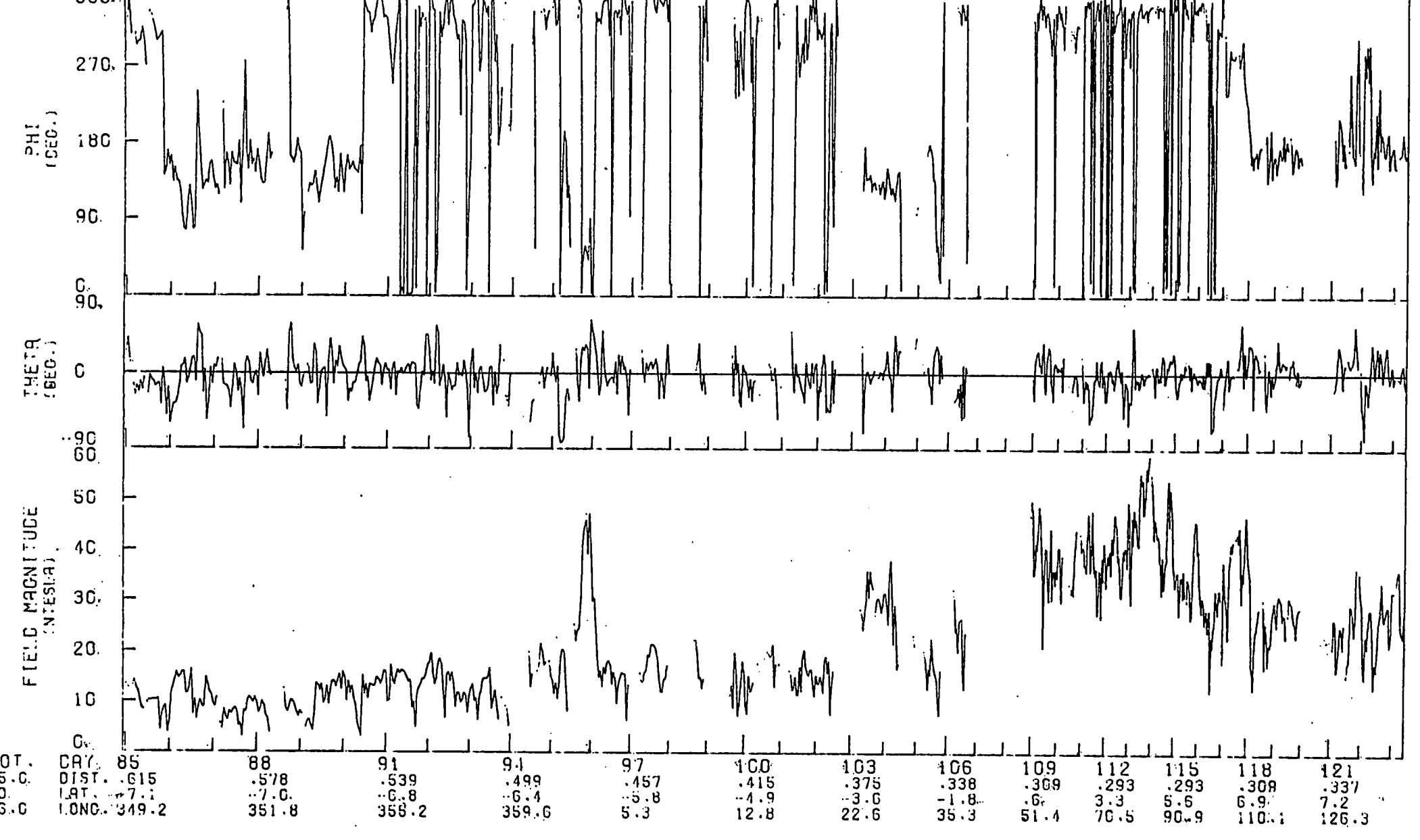


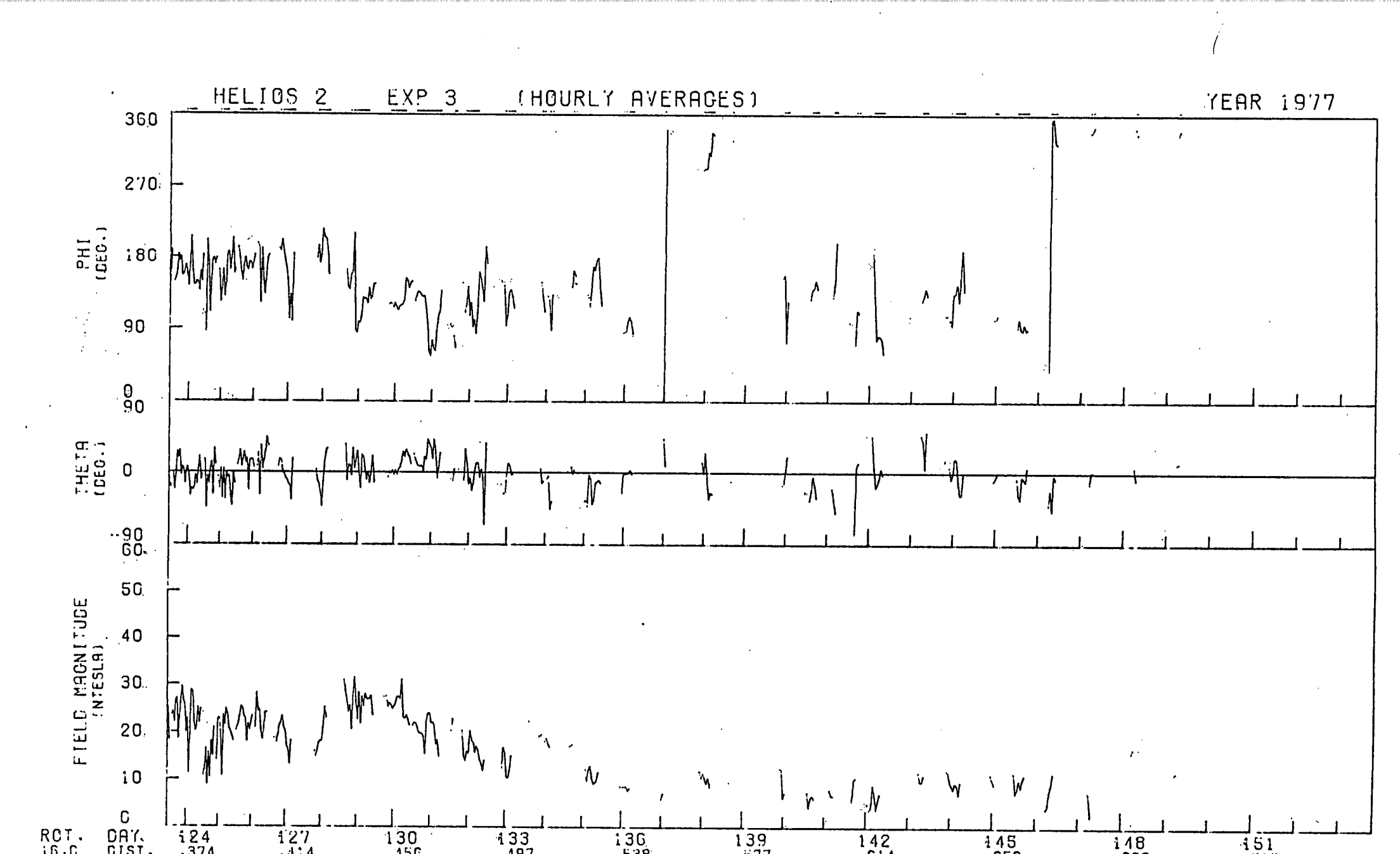
ROT.	DAY	343	346	349	352	355	358	361	364	1
11.0	DIST.	.820	.843	.863	.882	.899	.915	.928	.941	.951
TO	LAT.	-.7	-1.0	-1.4	-1.7	-2.0	-2.3	-2.6	-2.8	-3.1
12.0	LONG.	4.6	4.5	4.1	3.7	3.1	2.5	1.7	.9	.1

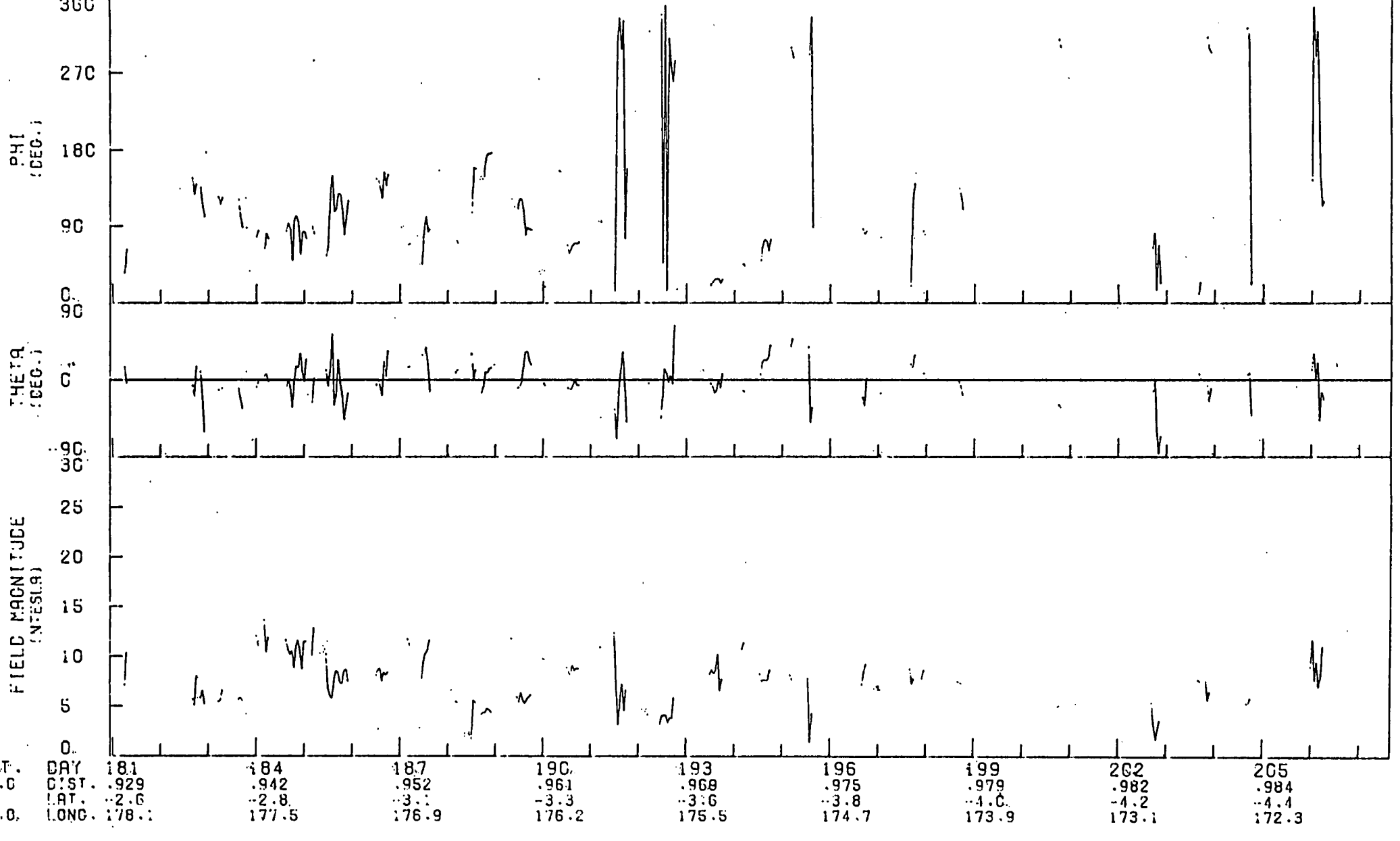

HELIOS 2 EXP 3 (HOURLY AVERAGES)
YEAR 1977
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
DAY
4
7
10
13
16
19
22
25
28
DIST.
2.0
.961
.968
.974
.979
.982
.983
.984
.982
.979


PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 1360
DAY 31 34 37 40 43 46 49 52 55
DIST. .975 .969 .961 .952 .942 .930 .916 .901 .884
LAT. -5.2 -5.4 -5.6 -5.7 -5.9 -6.1 -6.2 -6.4 -6.5
LONG. 350.4 349.4 348.5 347.6 346.8 346.0 345.3 344.7 344.2

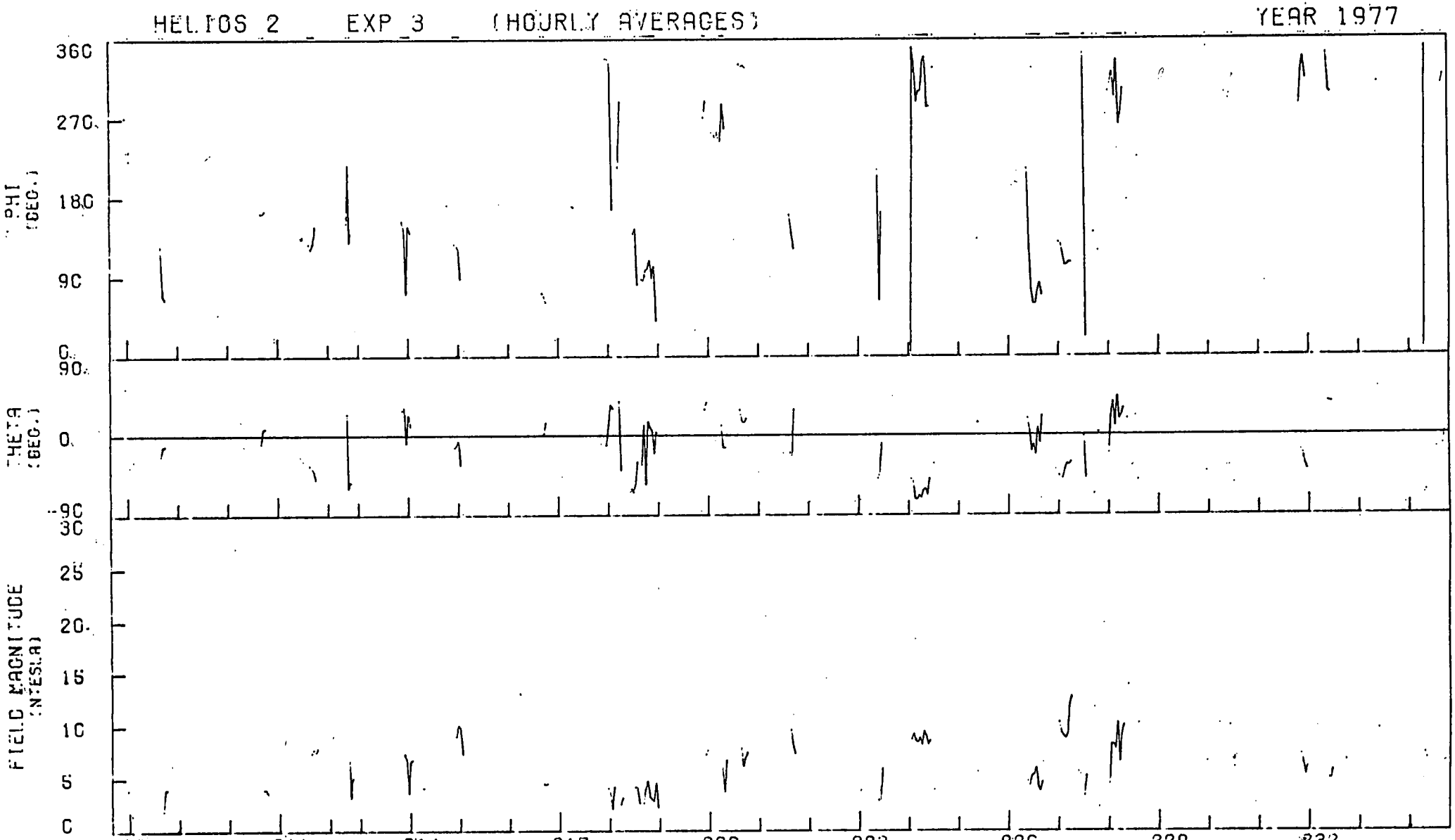

HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1977
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
58
61
64
67
70
73
76
79
82

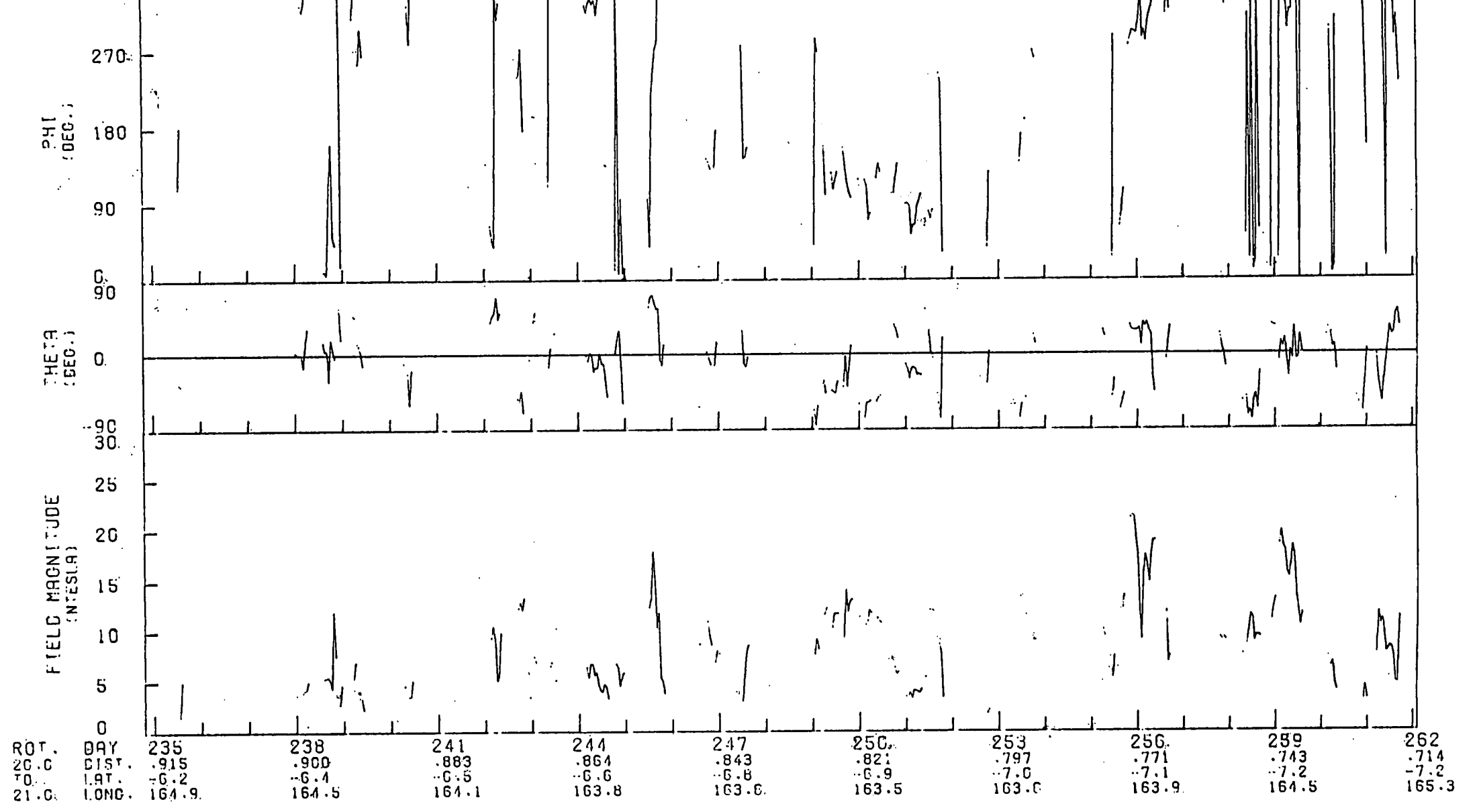

PHI (DEG.)
270.
180
90.
0.
THETA (DEG.)
90.
0
-90
FIELD MAGNITUDE (NTESLA)
60.
50
40.
30.
20.
10
0.
OT. DAY 85 88 91 94 97 100 103 106 109 112 115 118 121
S.C. DIST. .615 .578 .539 .499 .457 .415 .375 .338 .309 .293 .293 .309 .337
O LAT. -7.1 -7.0 -6.8 -6.4 -5.8 -4.9 -3.6 -1.8 .6 3.3 5.6 6.9 7.2
S.C LONG. 349.2 351.8 356.2 359.6 5.3 12.8 22.6 35.3 51.4 70.5 90.9 110.1 126.3

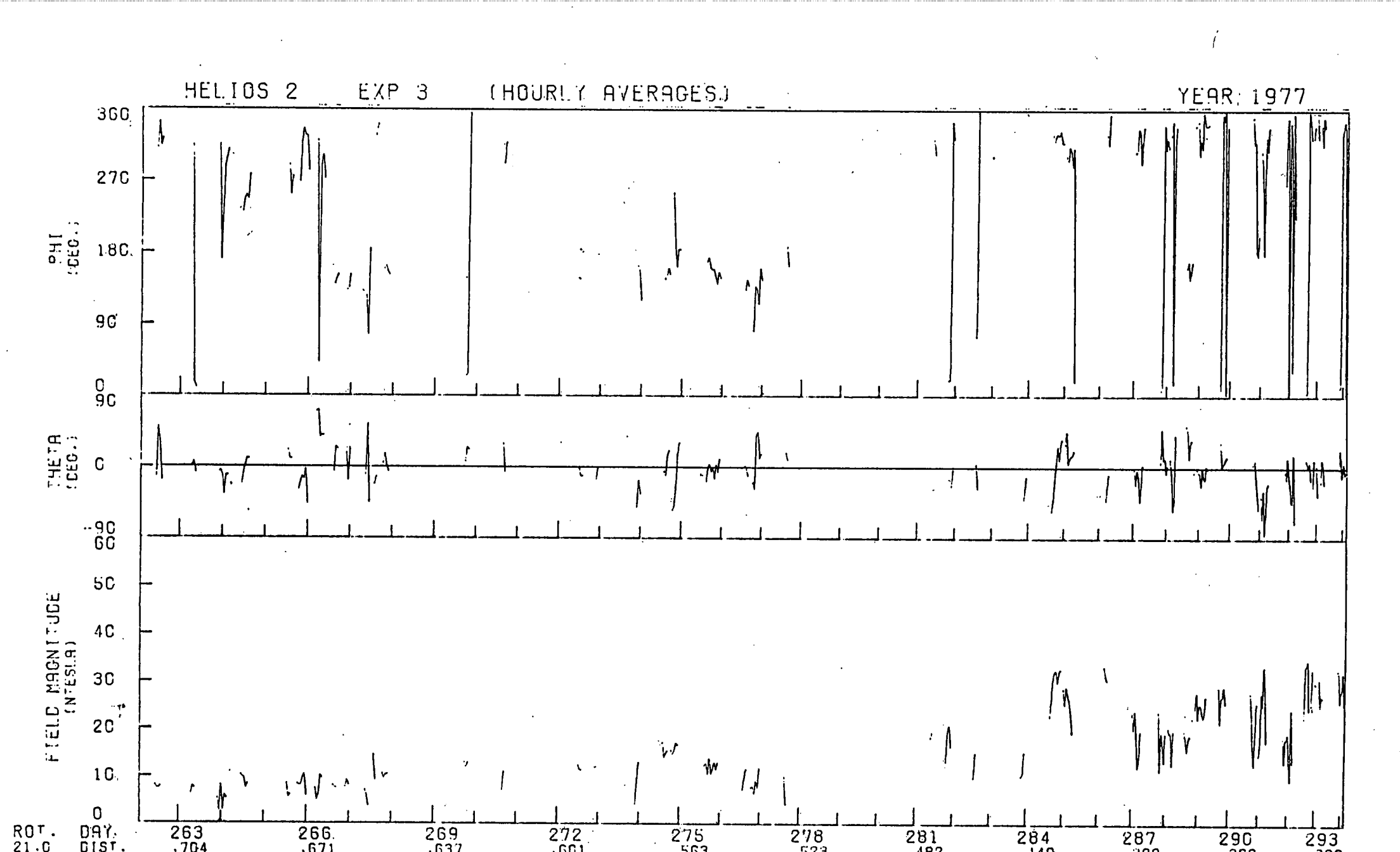

HELIOS 2 EXP 3 (HOURLY AVERAGES)
YEAR 1977
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY.
124
127
130
133
136
139
142
145
148
151

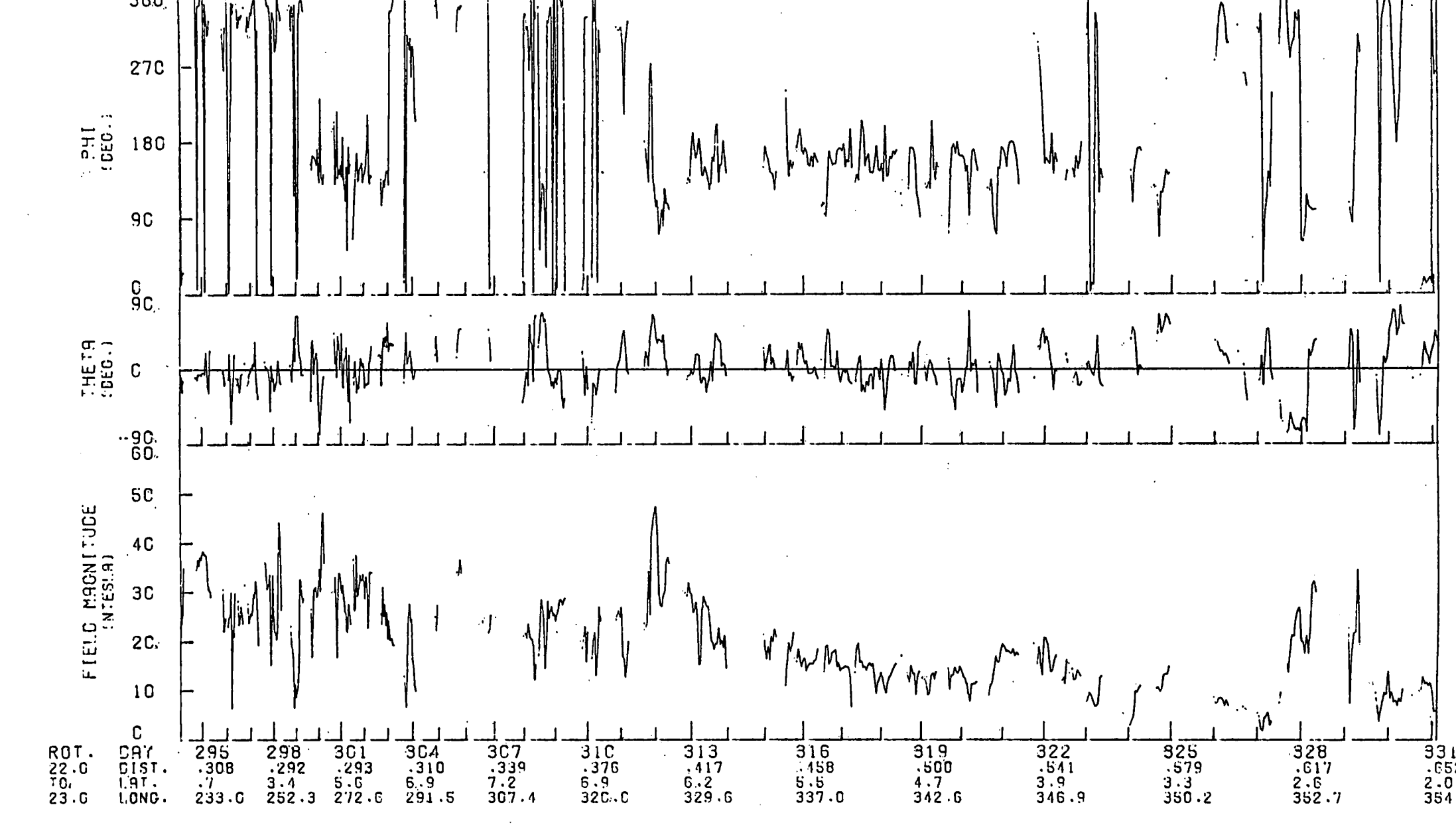


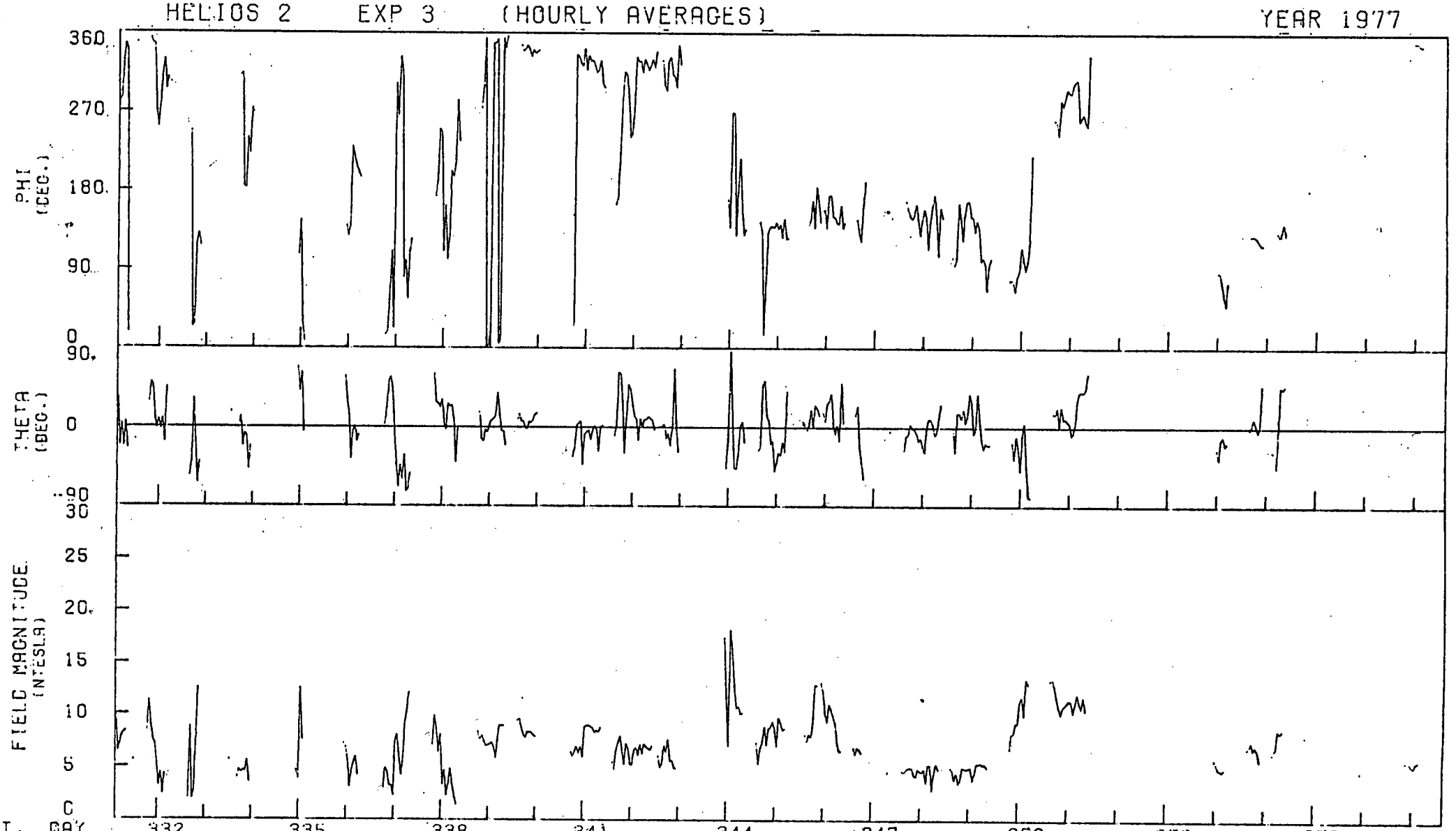
ROT.	DAY	181	184	187	190	193	196	199	202	205
18.0	DIST.	.929	.942	.952	.961	.968	.975	.979	.982	.984
TO	LAT.	-2.6	-2.8	-3.1	-3.3	-3.6	-3.8	-4.0	-4.2	-4.4
19.0	LONG.	178.1	177.5	176.9	176.2	175.5	174.7	173.9	173.1	172.3

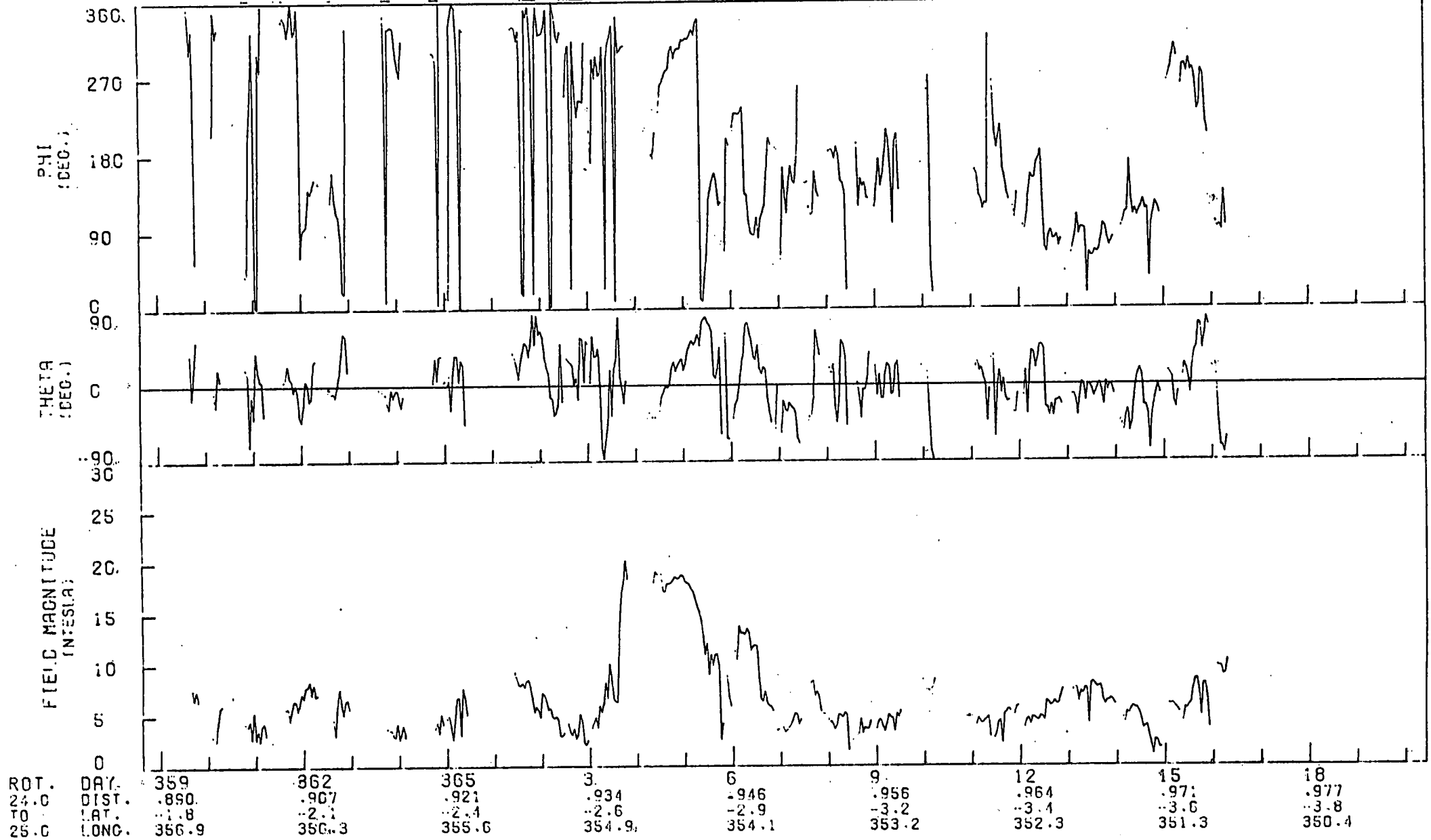

HELIOS 2 EXP 3 (HOURLY AVERAGES)
YEAR 1977
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0

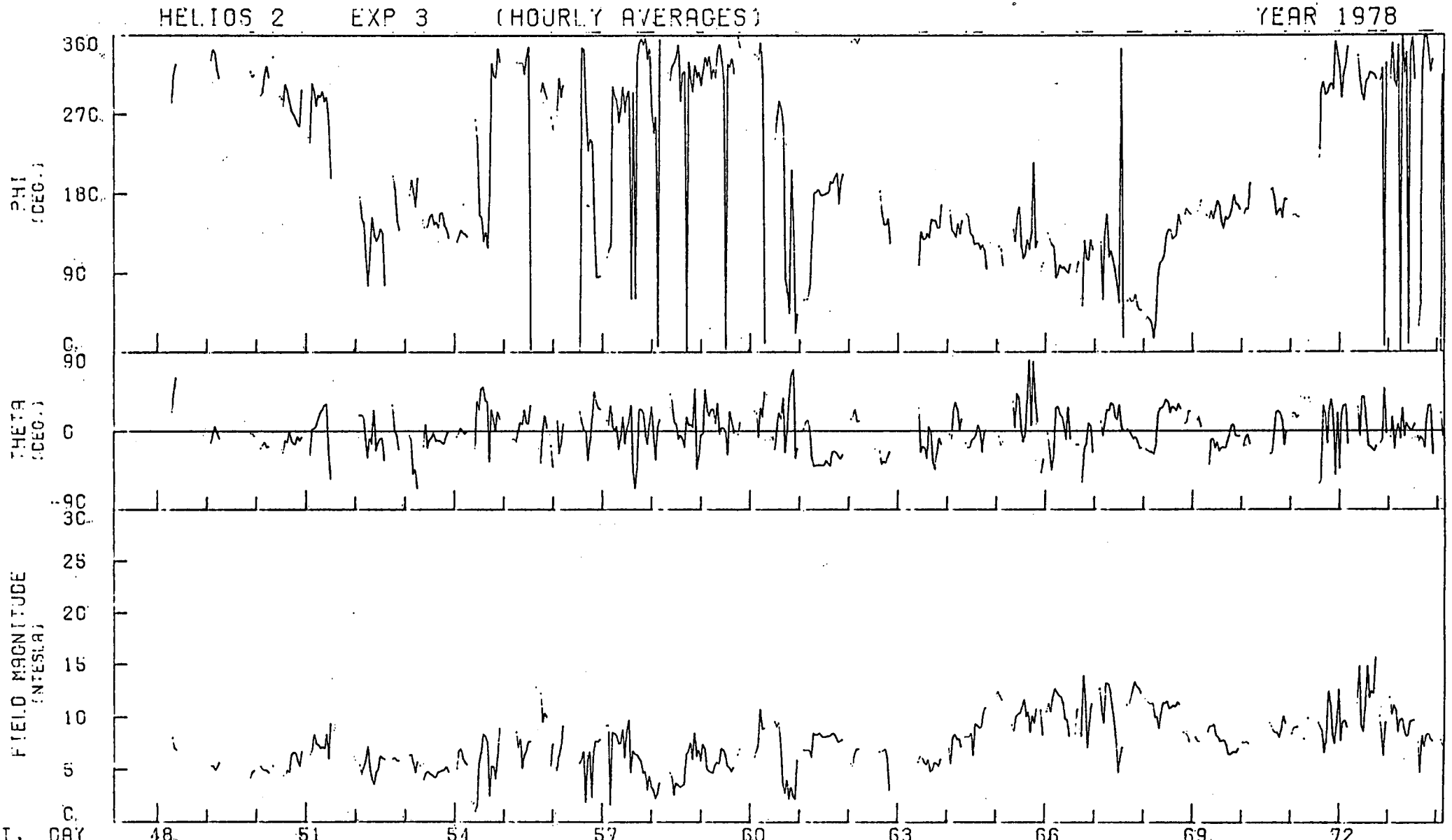

PHI (DEG.)
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY 235 238 241 244 247 250 253 256 259 262
20.0 DIST. .915 .900 .883 .864 .843 .821 .797 .771 .743 .714
TO.. LAT. -6.2 -6.4 -6.5 -6.6 -6.8 -6.9 -7.0 -7.1 -7.2 -7.2
21.0 LONG. 164.9 164.5 164.1 163.8 163.6 163.5 163.6 163.9 164.5 165.3

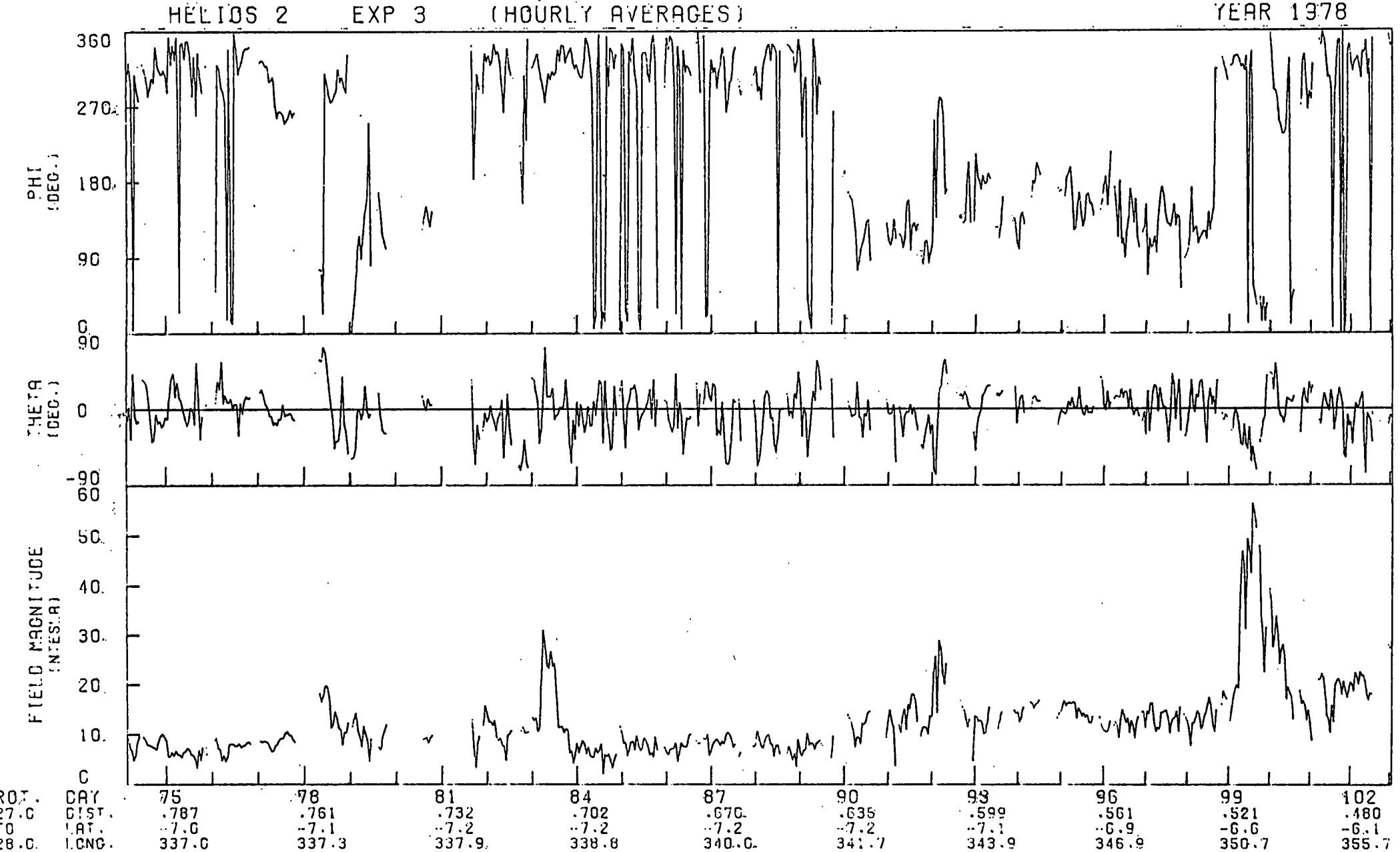

HELIOS 2 EXP 3 (HOURLY AVERAGES)
YEAR: 1977
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY.
21.0 DIST.
263
.704
266
.671
269
.637
272
275
278
281
284
287
290
293

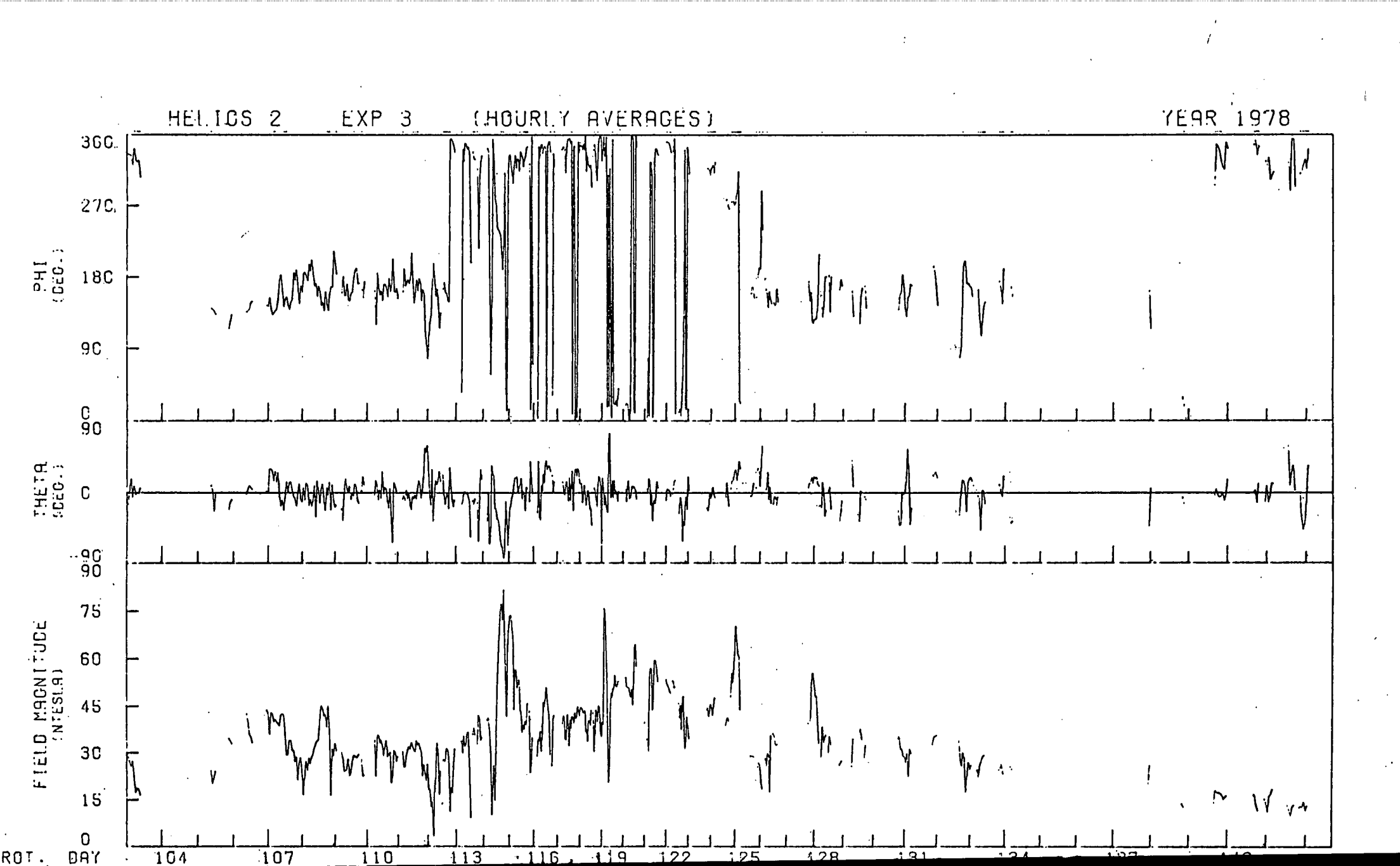

PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. 22.0 TO 23.0
DAY 295 298 301 304 307 310 313 316 319 322 325 328 331
DIST. .308 .292 .293 .310 .339 .376 .417 .458 .500 .541 .579 .617 .65
LAT. .7 3.4 5.6 6.9 7.2 6.9 6.2 5.5 4.7 3.9 3.3 2.6 2.0
LONG. 233.0 252.3 272.6 291.5 307.4 320.0 329.6 337.0 342.6 346.9 350.2 352.7 354


HELIOS 2 EXP 3 (HOURLY AVERAGES)
YEAR 1977
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
332
335
338
341
344
347
350
353
356

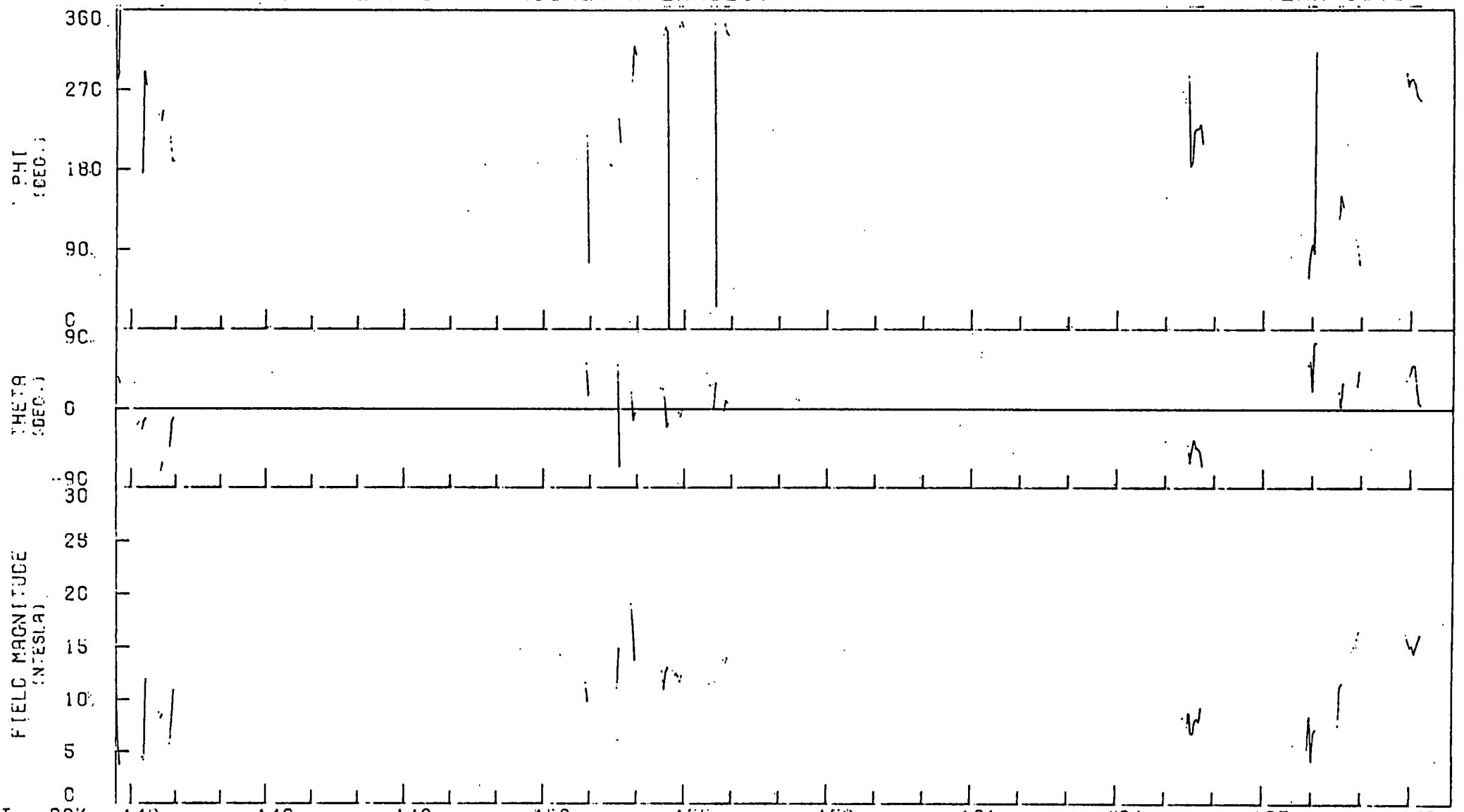

PHI (DEG.)
360.
270
180
90
0
THETA (DEG.)
90.
0
-90.
FIELD MAGNITUDE (NTESLA)
30
25
20.
15
10
5
0
ROT. 359 362 365 3. 6 9. 12 15 18
24.0 DIST. .890. .907 .921 .934 .946 .956 .964 .97: .977
TO LAT. -1.8 -2.1 -2.4 -2.6 -2.9 -3.2 -3.4 -3.6 -3.8
25.0 LONG. 356.9 356.3 355.6 354.9 354.1 353.2 352.3 351.3 350.4


HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1978
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
48
51
54
57
60
63
66
69
72

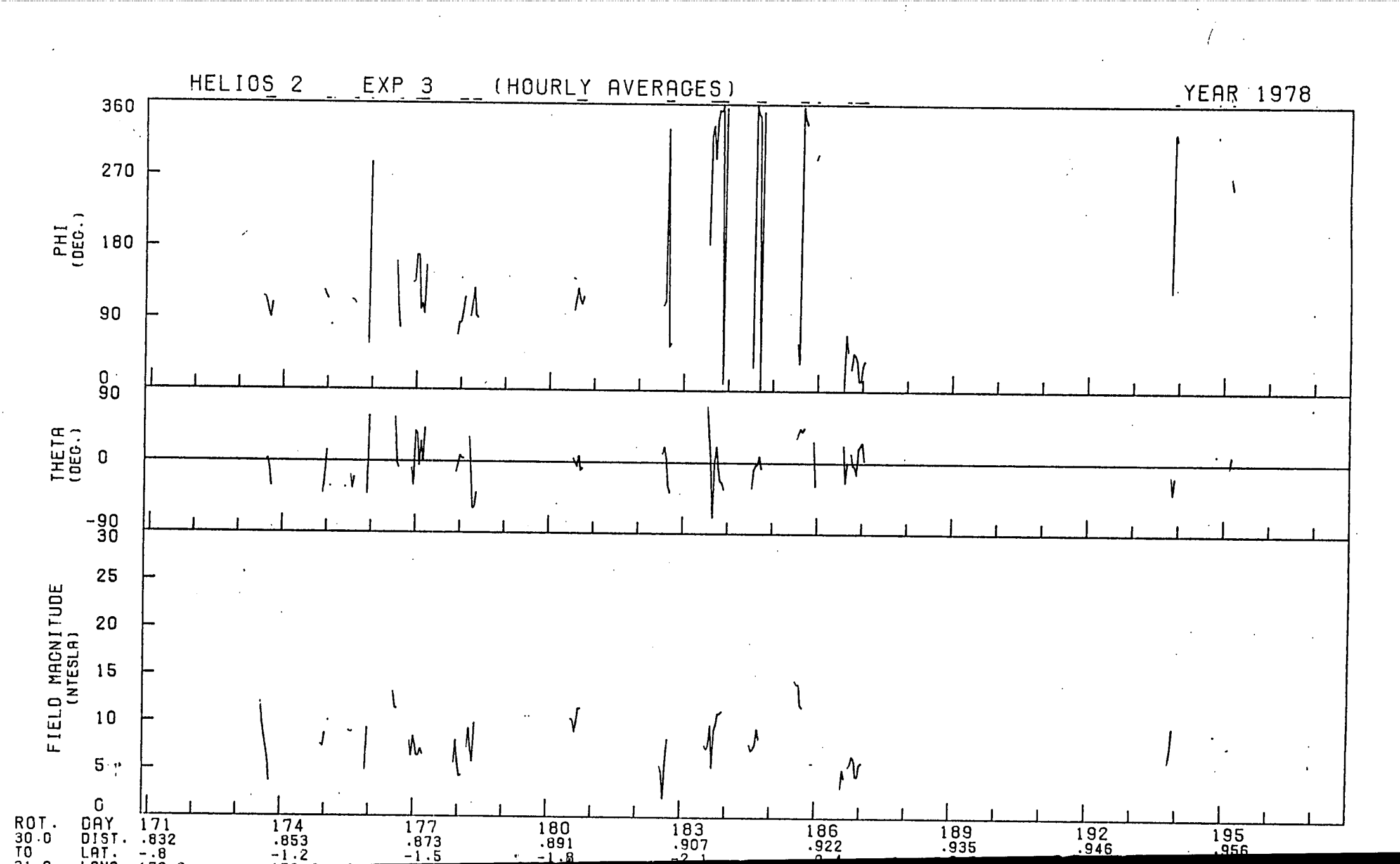

HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1978
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY 75 78 81 84 87 90 93 96 99 102
27.0 DIST. .787 .761 .732 .702 .670 .635 .599 .561 .521 .480
0 LAT. -7.0 -7.1 -7.2 -7.2 -7.2 -7.2 -7.1 -6.9 -6.6 -6.1
28.0 LONG. 337.0 337.3 337.9 338.8 340.0 341.7 343.9 346.9 350.7 355.7

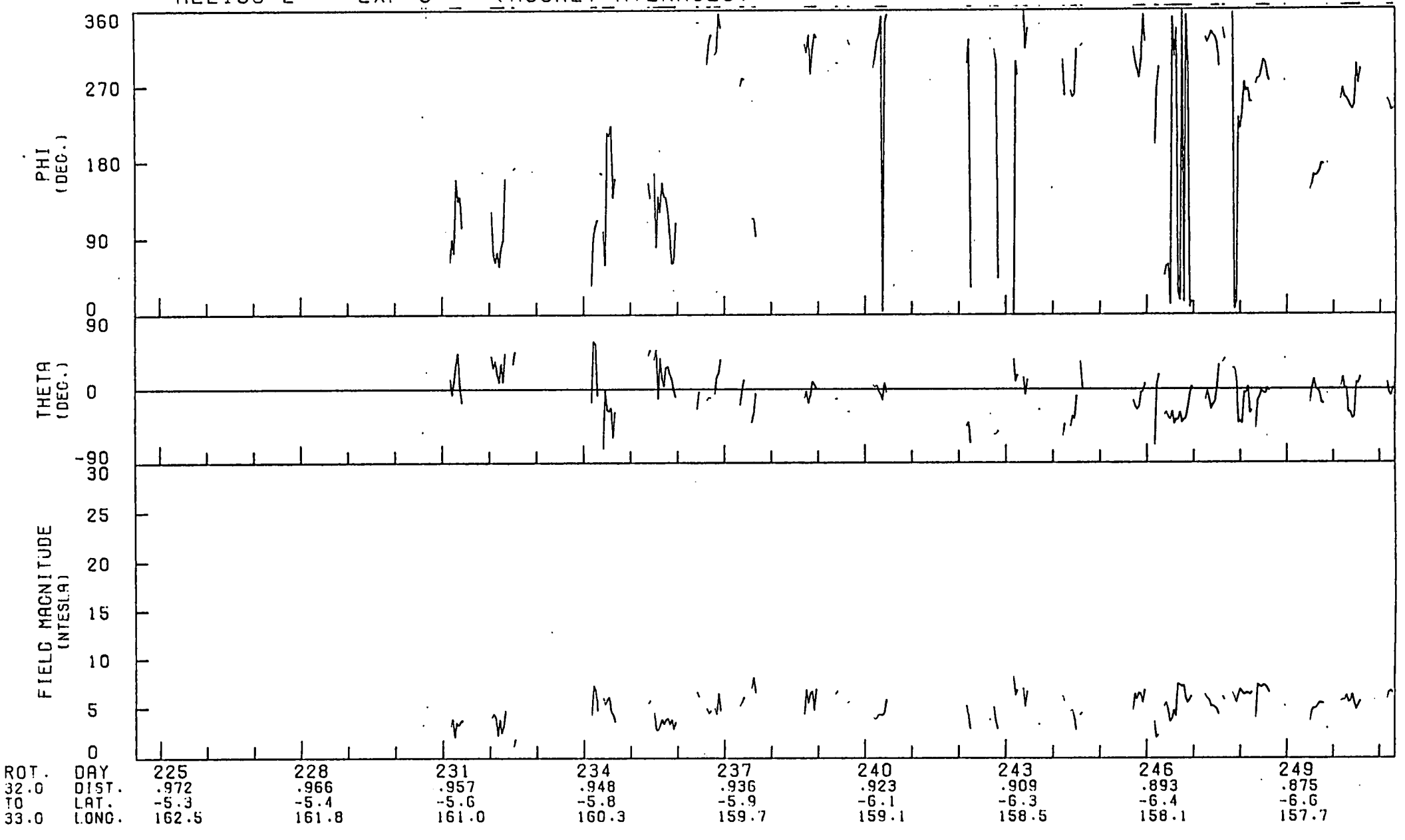

HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1978
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
90
75
60
45
30
15
0
ROT. DAY
104
107
110
113
116
119
122
125
128
131
134

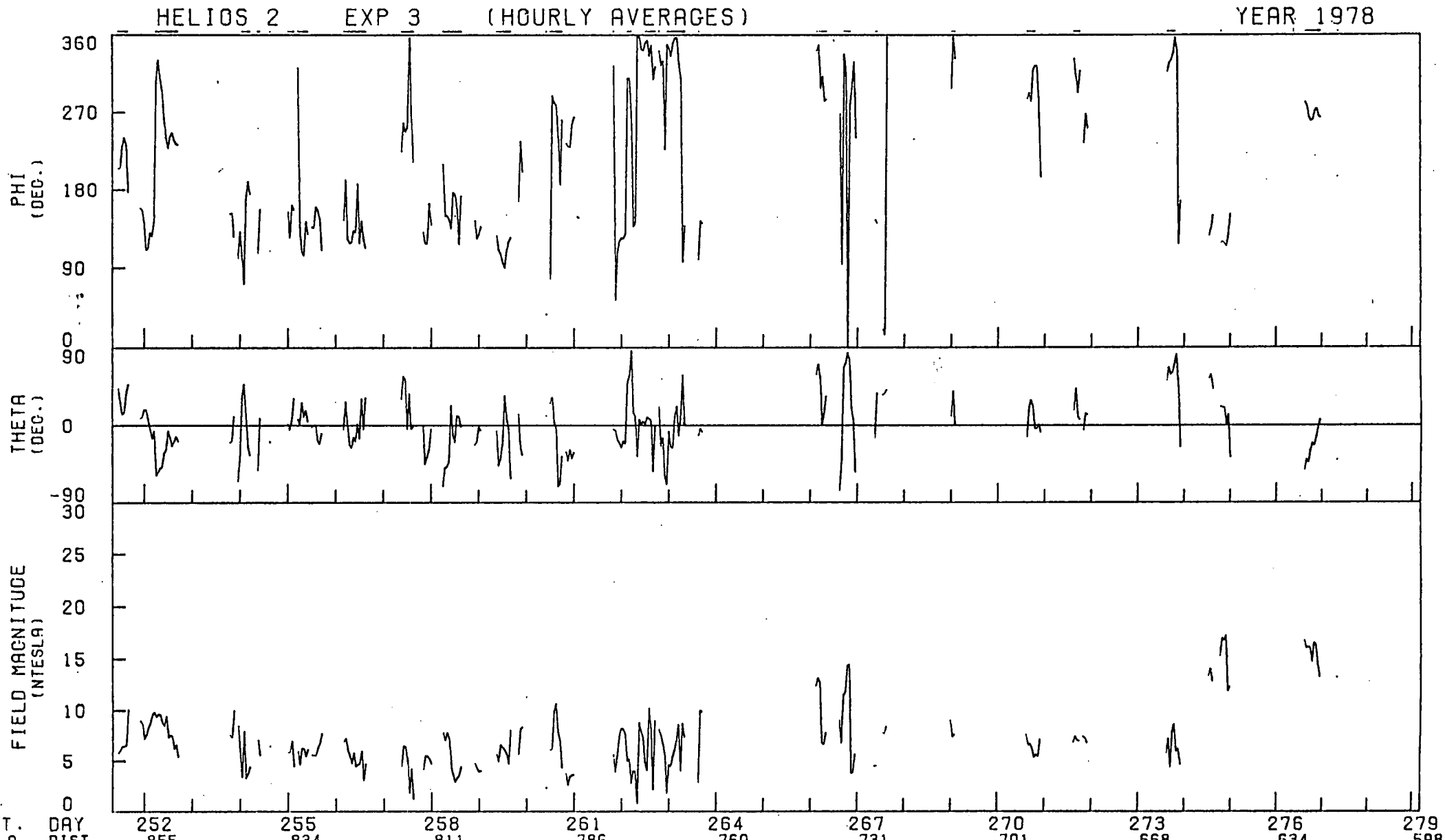
HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1978

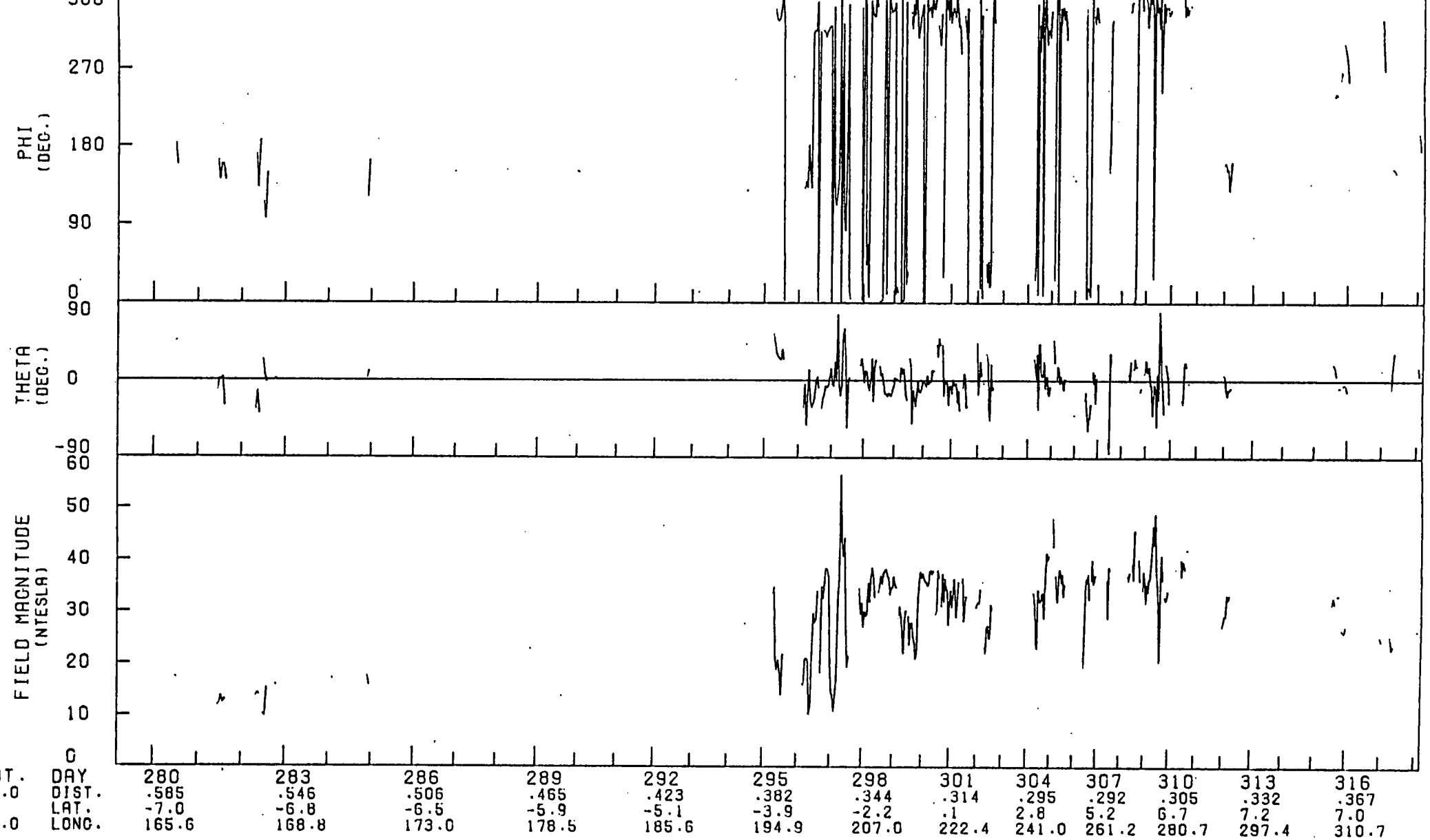


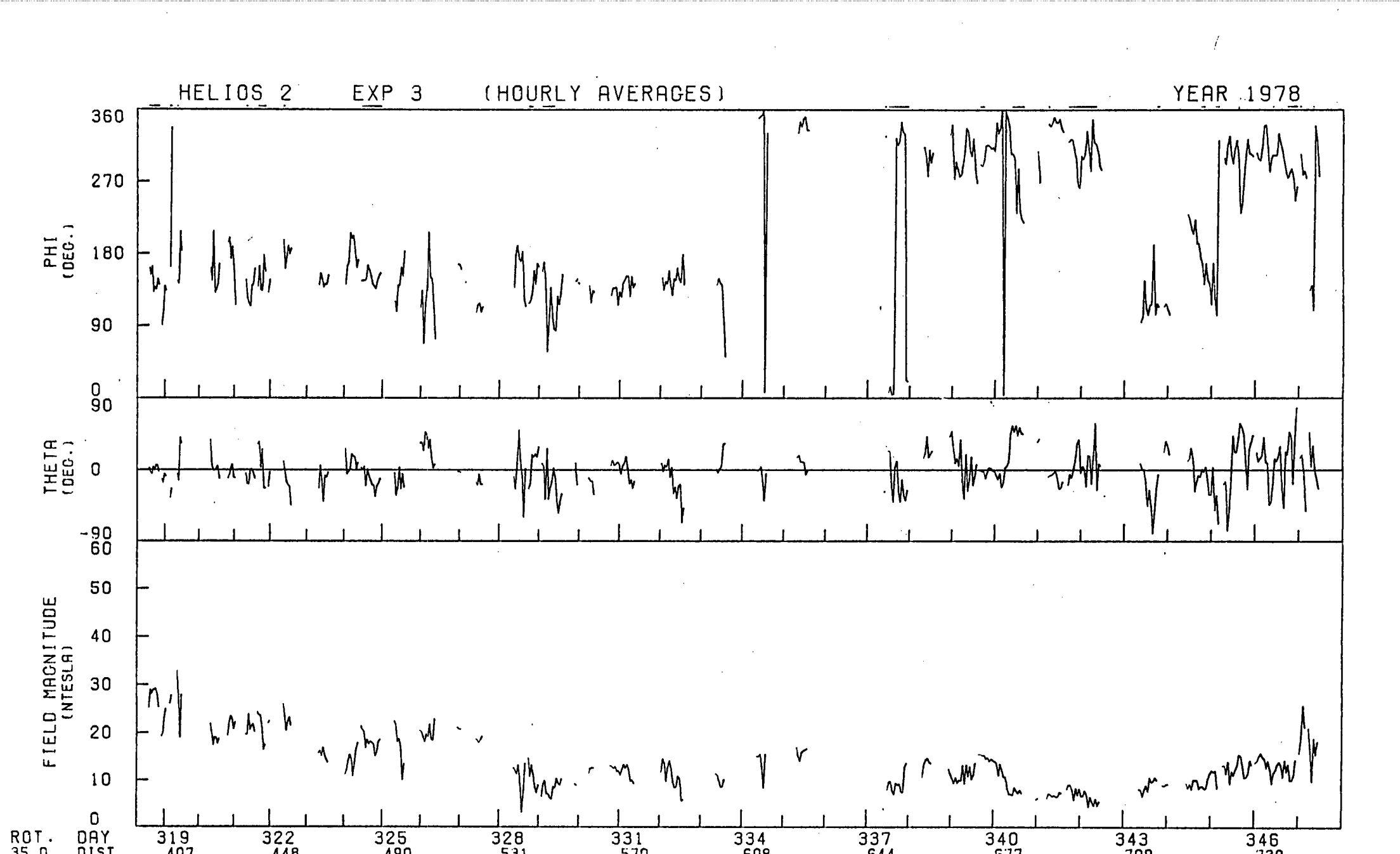
ROT.	DAY.	143	146	149	152	155	158	161	164	167	170
29.0	DIST.	.542	.581	.618	.654	.687	.718	.748	.775	.801	.824
TO	LAT.	3.9	3.2	2.6	2.0	1.5	1.0	.5	.1	-.3	-.7
30.0	LONG.	161.2	164.6	167.3	169.3	170.8	172.0	172.8	173.3	173.7	173.8

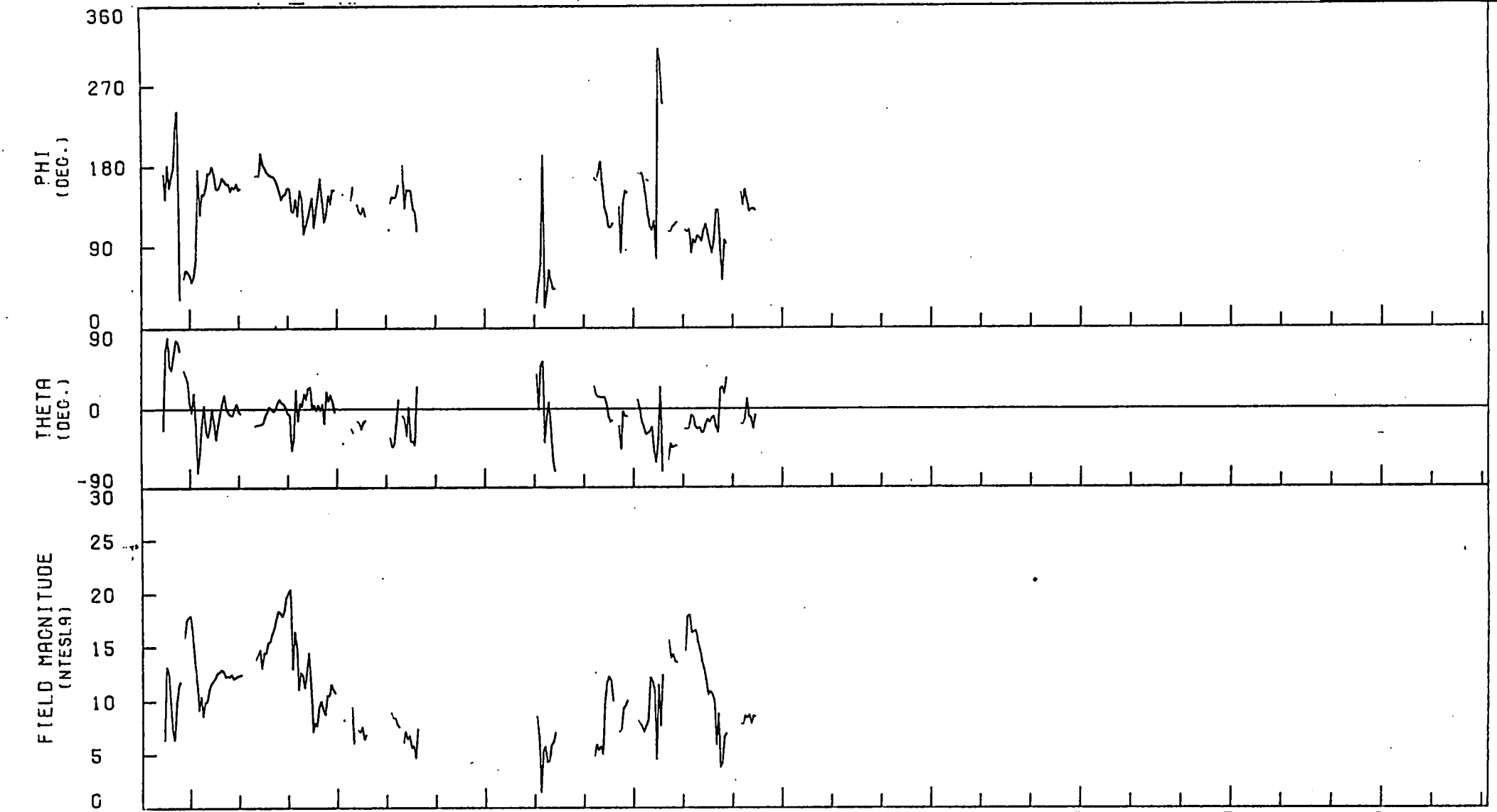

HELIOS 2 EXP 3 (HOURLY AVERAGES)
YEAR 1978
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY 171 174 177 180 183 186 189 192 195
30.0 DIST. .832 .853 .873 .891 .907 .922 .935 .946 .956
TO LAT. -.8 -1.2 -1.5 -1.8


PHI (DEC.)
360
270
180
90
0
THETA (DEC.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 32.0 TO 33.0
DAY 225 228 231 234 237 240 243 246 249
DIST. .972 .966 .957 .948 .936 .923 .909 .893 .875
LAT. -5.3 -5.4 -5.6 -5.8 -5.9 -6.1 -6.3 -6.4 -6.6
LONG. 162.5 161.8 161.0 160.3 159.7 159.1 158.5 158.1 157.7

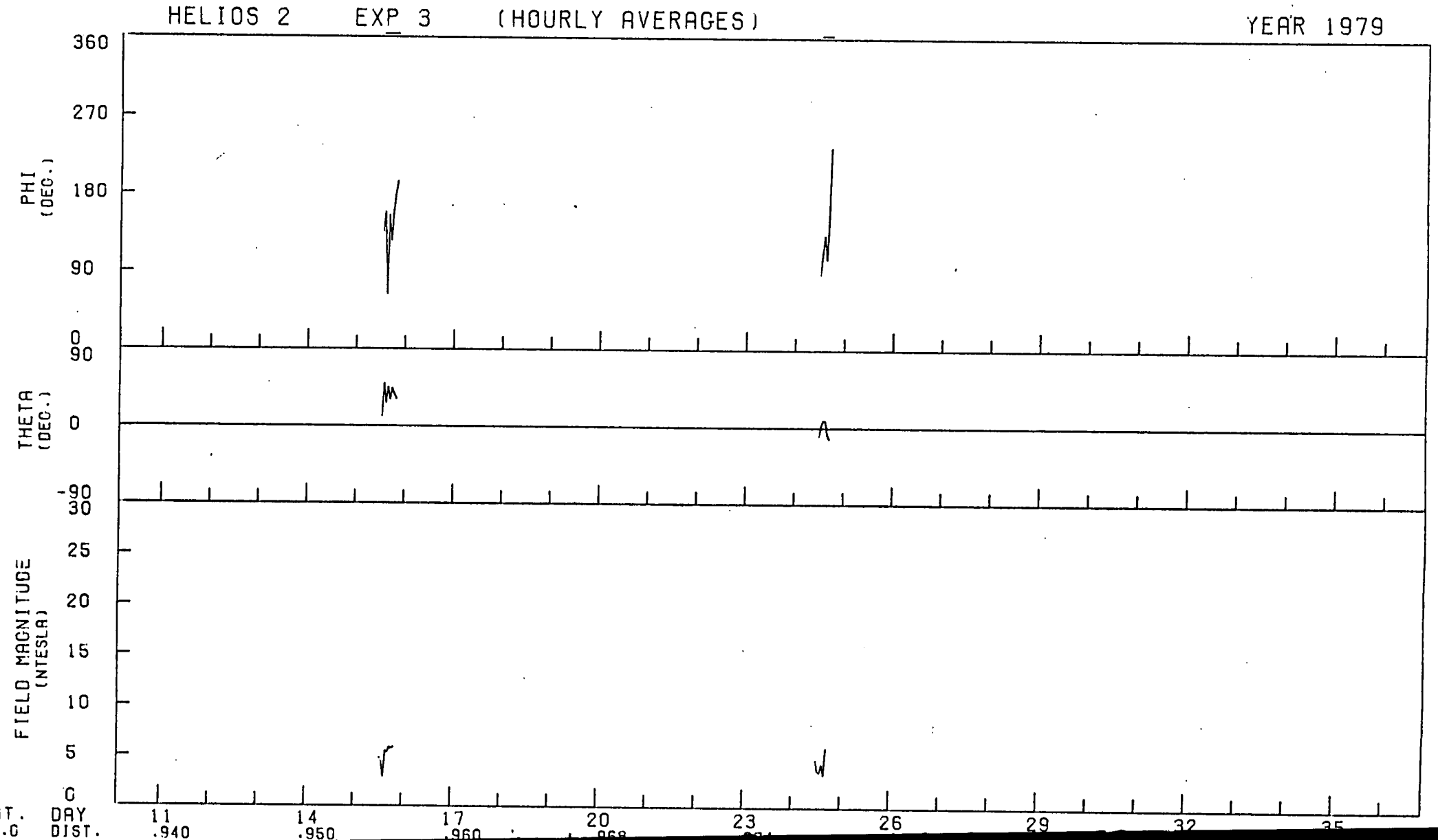

HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1978
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
252
255
258
261
264
267
270
273
276
279

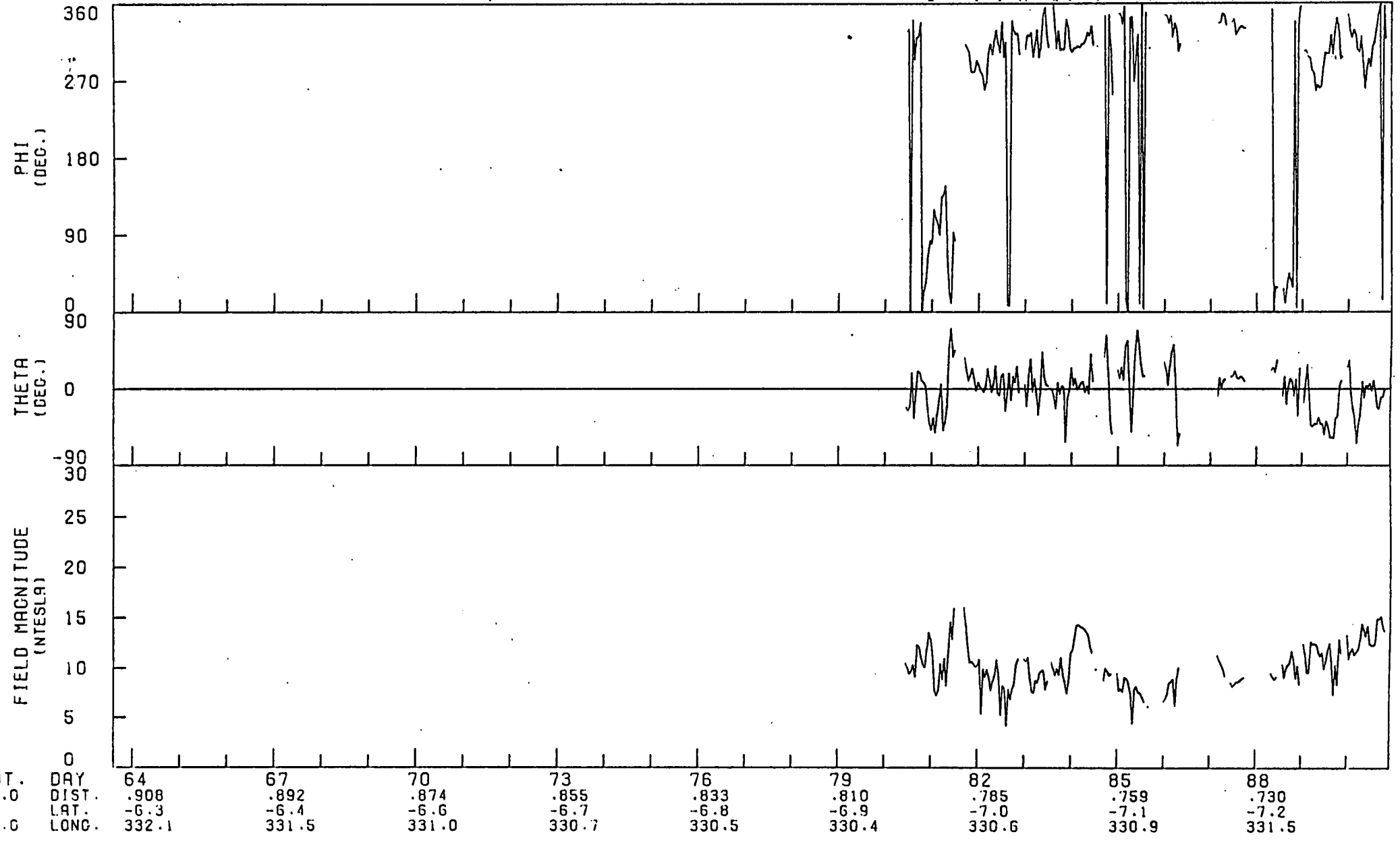

PHI (DEG.)
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY 280 283 286 289 292 295 298 301 304 307 310 313 316
34.0 DIST. .585 .546 .506 .465 .423 .382 .344 .314 .295 .292 .305 .332 .367
TO LAT. -7.0 -6.8 -6.5 -5.9 -5.1 -3.9 -2.2 .1 2.8 5.2 6.7 7.2 7.0
35.0 LONG. 165.6 168.8 173.0 178.5 185.6 194.9 207.0 222.4 241.0 261.2 280.7 297.4 310.7


HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1978
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY
319
322
325
328
331
334
337
340
343
346
DIST
407
448
490
531
570
608
644
677
708
738

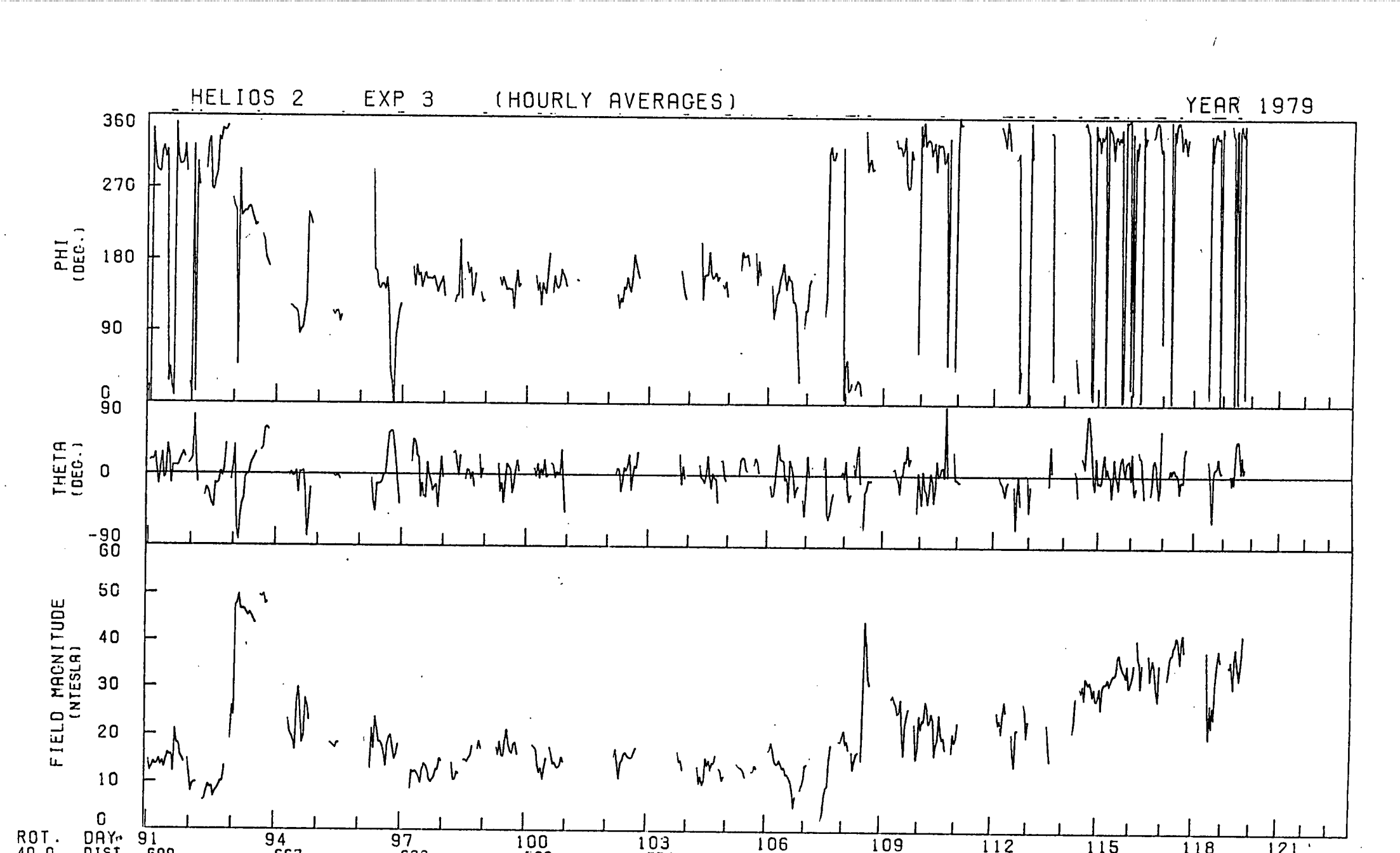


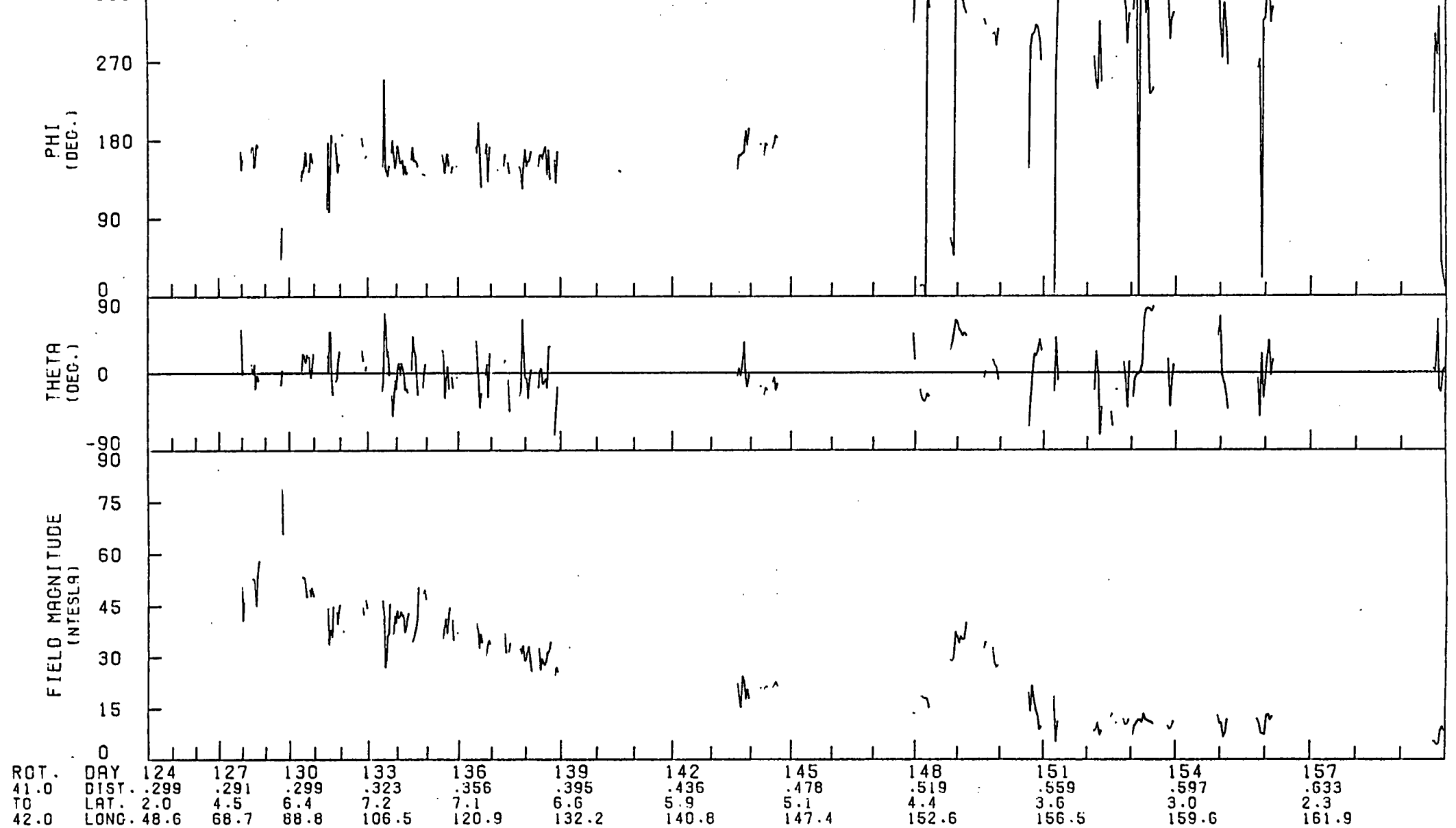
ROT.	DAY	349	352	355	358	361	364	2	5	8
36.0	DIST.	.767	.793	.818	.840	.861	.880	.897	.913	.927
TO	LAT.	.2	-.2	-.6	-1.0	-1.3	-1.6	-1.9	-2.2	-2.5
37.0	LONG.	351.4	351.6	351.6	351.4	351.1	350.6	350.1	349.4	348.7

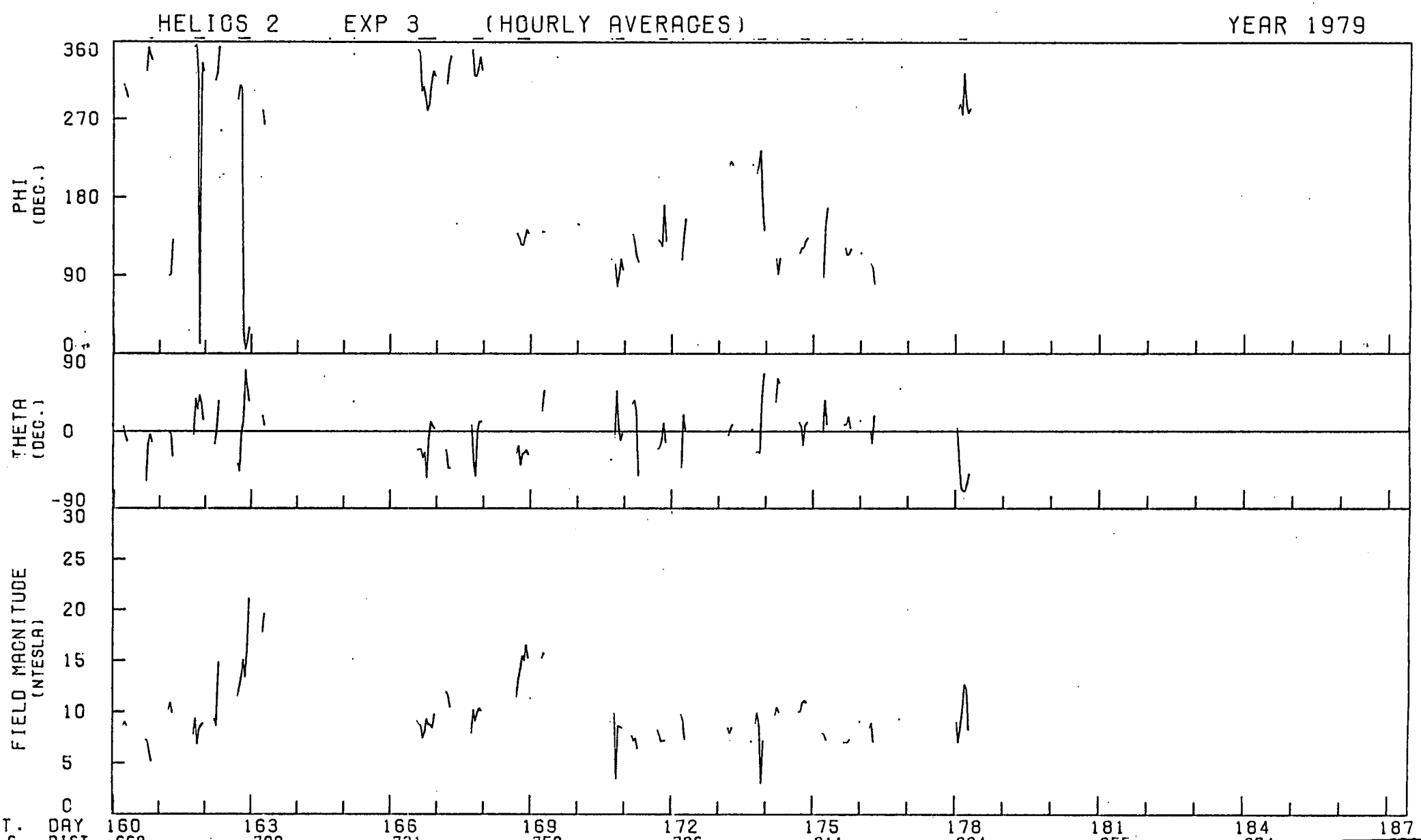

HELIOS 2 EXP 3 (HOURLY AVERAGES)
YEAR 1979
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
37.0 DIST.
11 .940
14 .950
17 .960
20
23
26
29
32
35

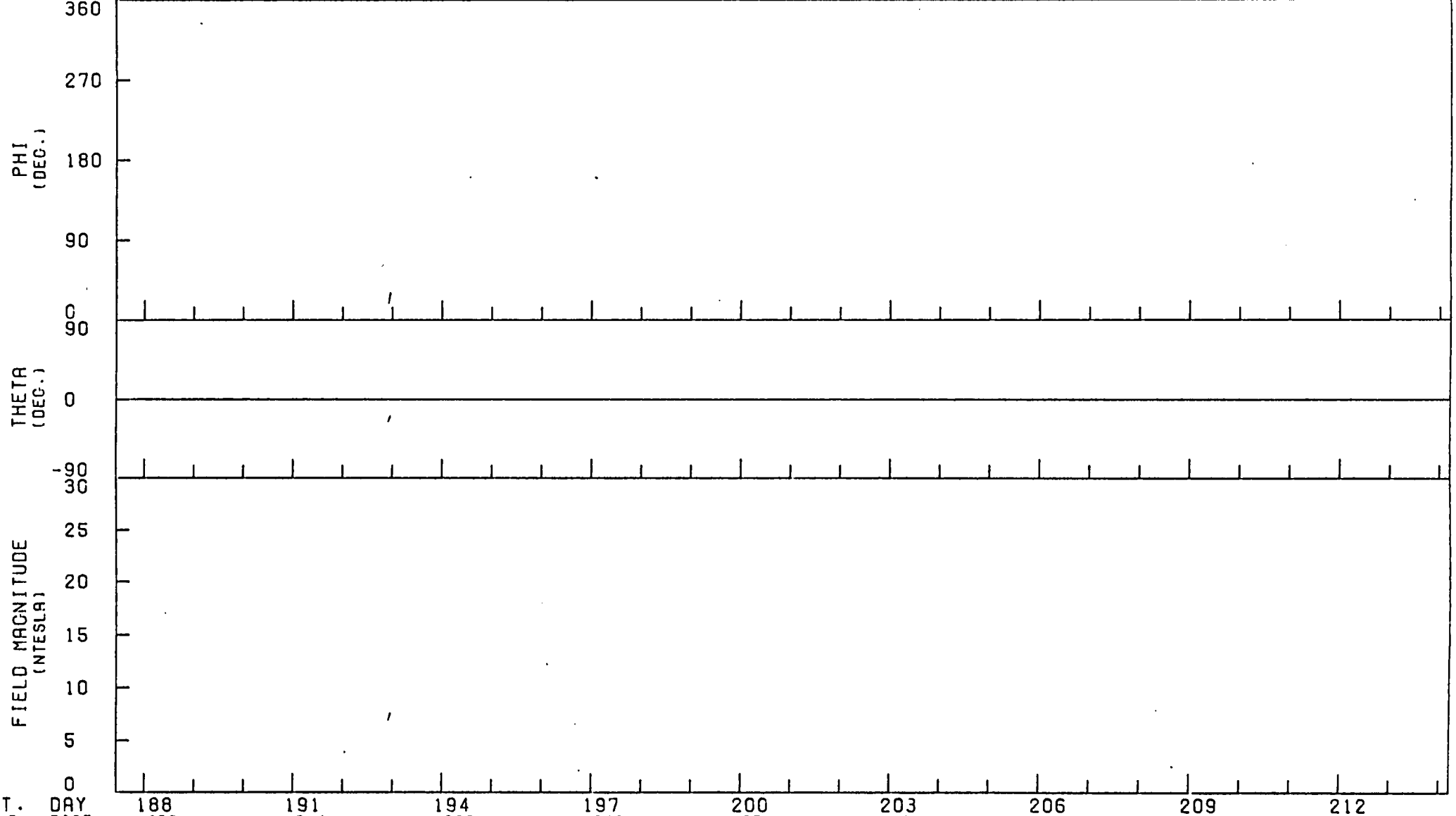


ROT.	DAY	64	67	70	73	76	79	82	85	88
39.0	DIST.	.908	.892	.874	.855	.833	.810	.785	.759	.730
TO	LAT.	-6.3	-6.4	-6.6	-6.7	-6.8	-6.9	-7.0	-7.1	-7.2
40.0	LONG.	332.1	331.5	331.0	330.7	330.5	330.4	330.6	330.9	331.5

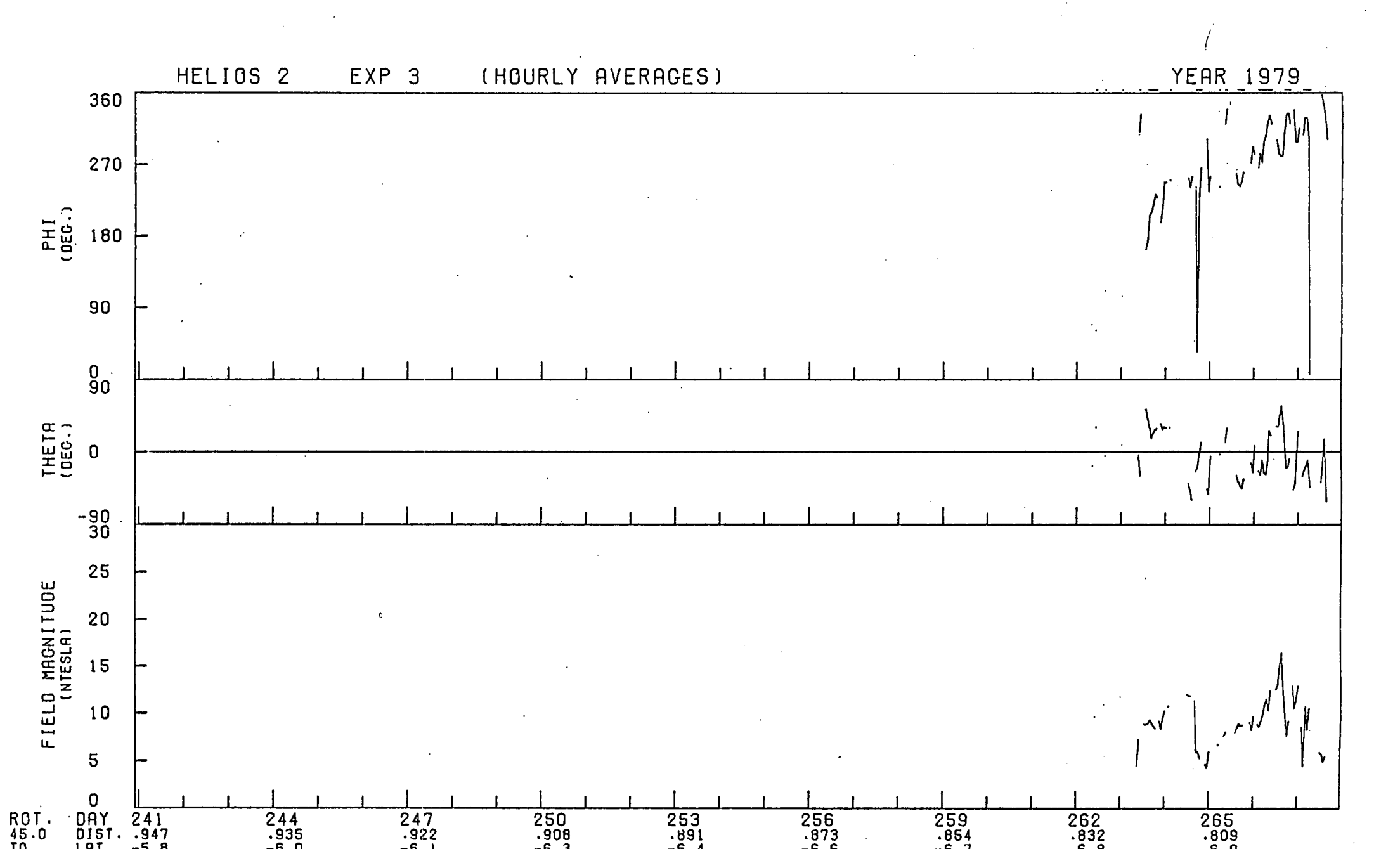

HELIOS 2 EXP 3 (HOURLY AVERAGES)
YEAR 1979
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY
91
94
97
100
103
106
109
112
115
118
121

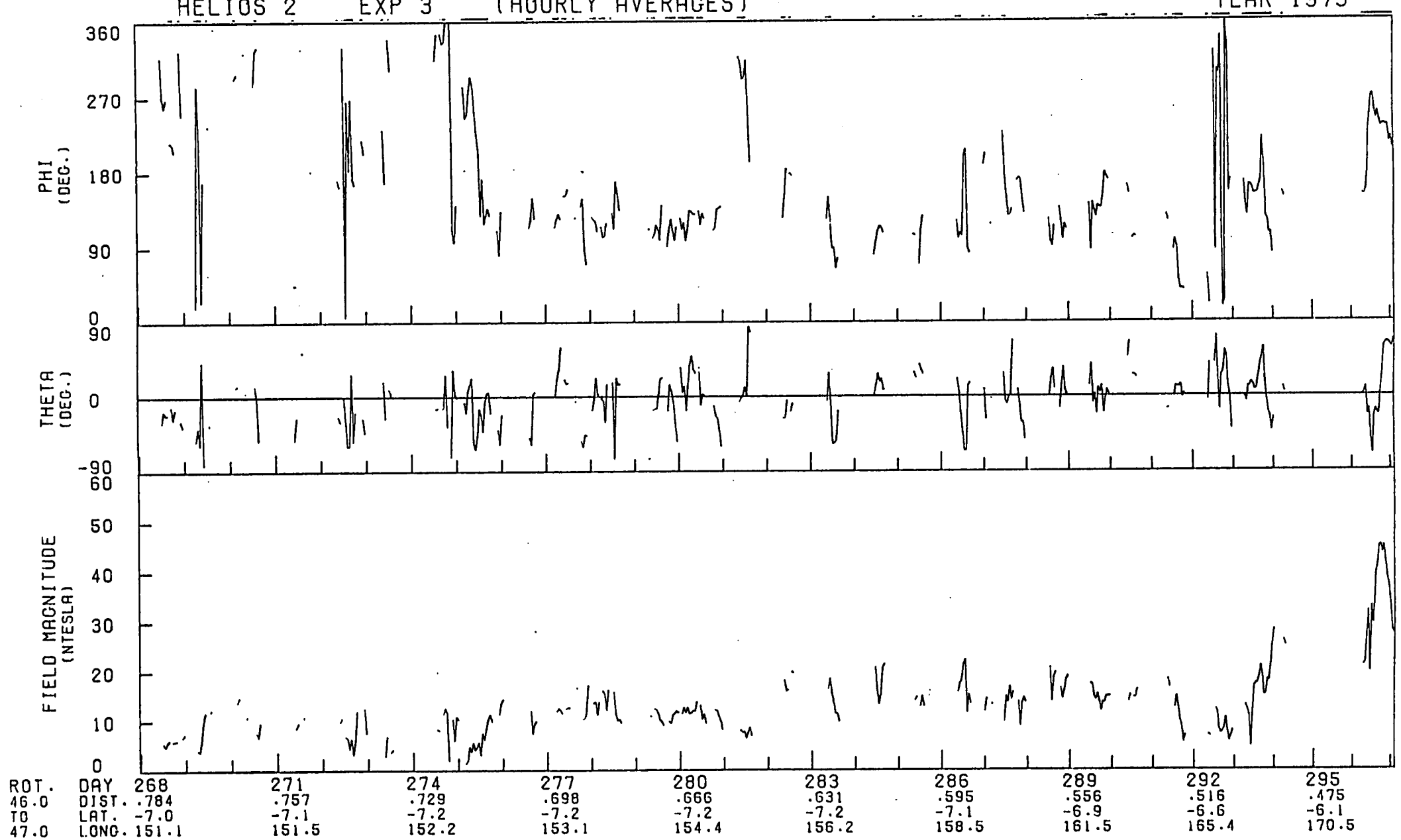

PHI (DEG.)
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
90
75
60
45
30
15
0
ROT. DAY 124 127 130 133 136 139 142 145 148 151 154 157
41.0 DIST. .299 .291 .299 .323 .356 .395 .436 .478 .519 .559 .597 .633
TO LAT. 2.0 4.5 6.4 7.2 7.1 6.6 5.9 5.1 4.4 3.6 3.0 2.3
42.0 LONG. 48.6 68.7 88.8 106.5 120.9 132.2 140.8 147.4 152.6 156.5 159.6 161.9

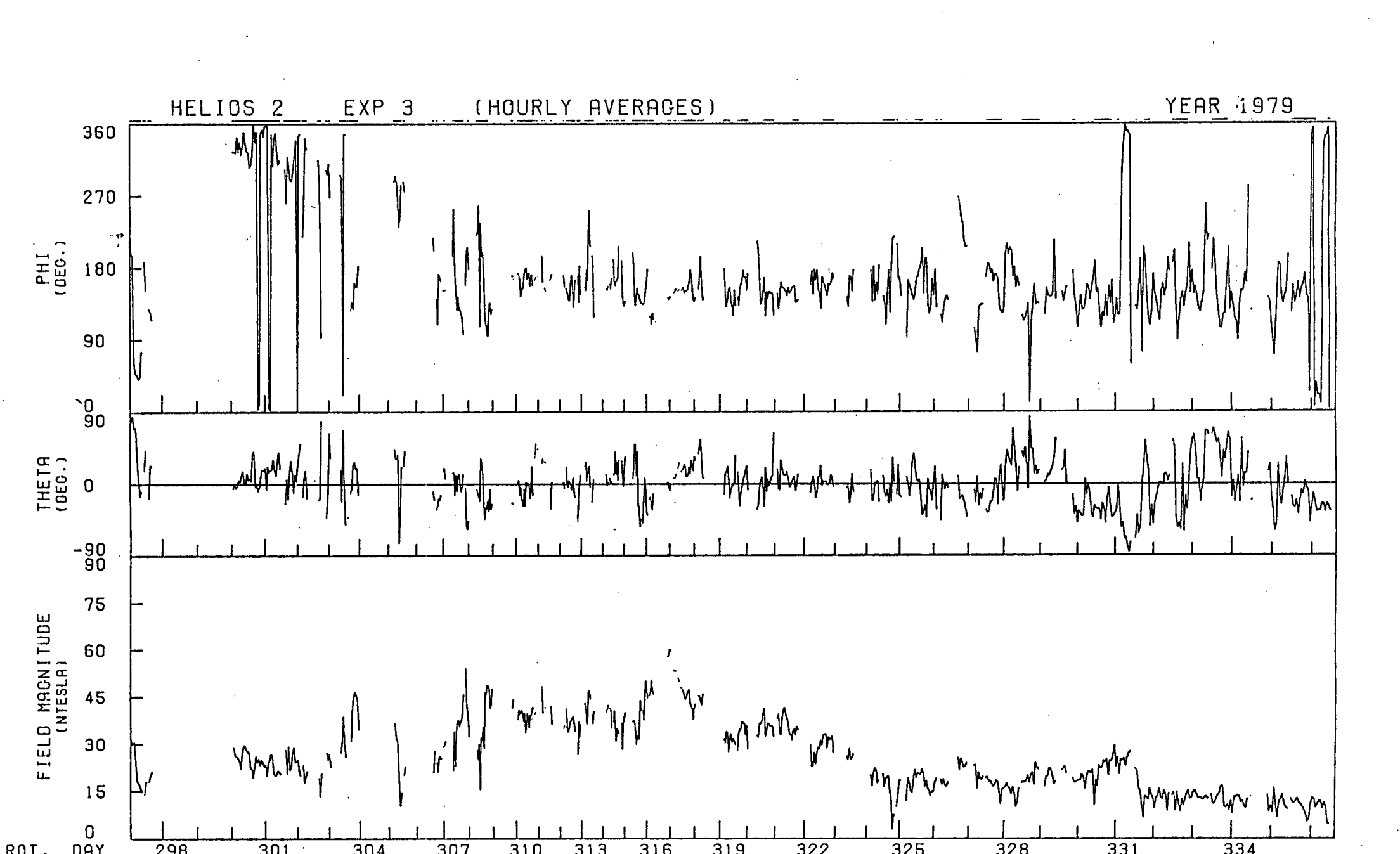

HELIOS 2 EXP 3 (HOURLY AVERAGES)
YEAR 1979
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
160
163
166
169
172
175
178
181
184
187

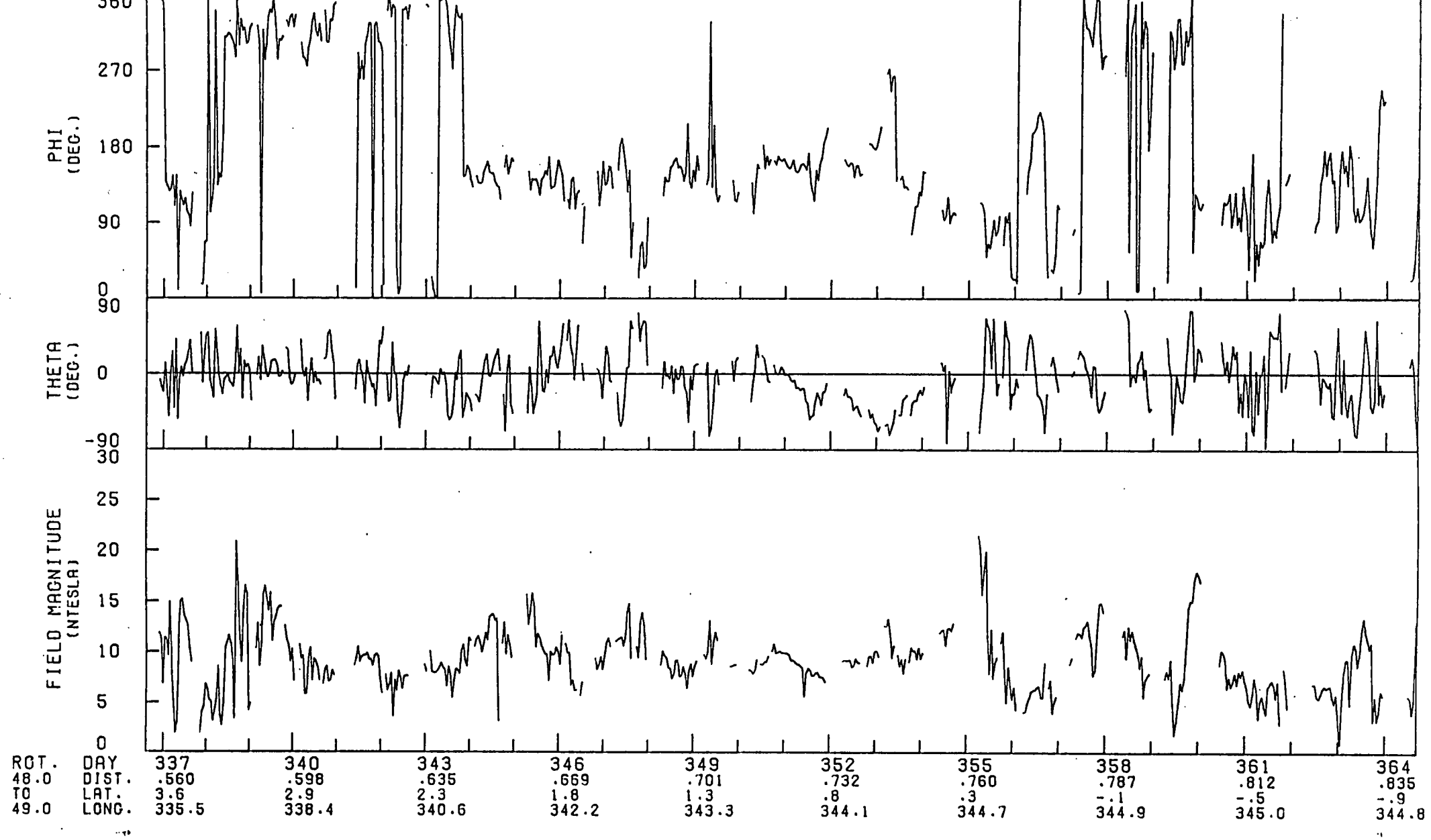


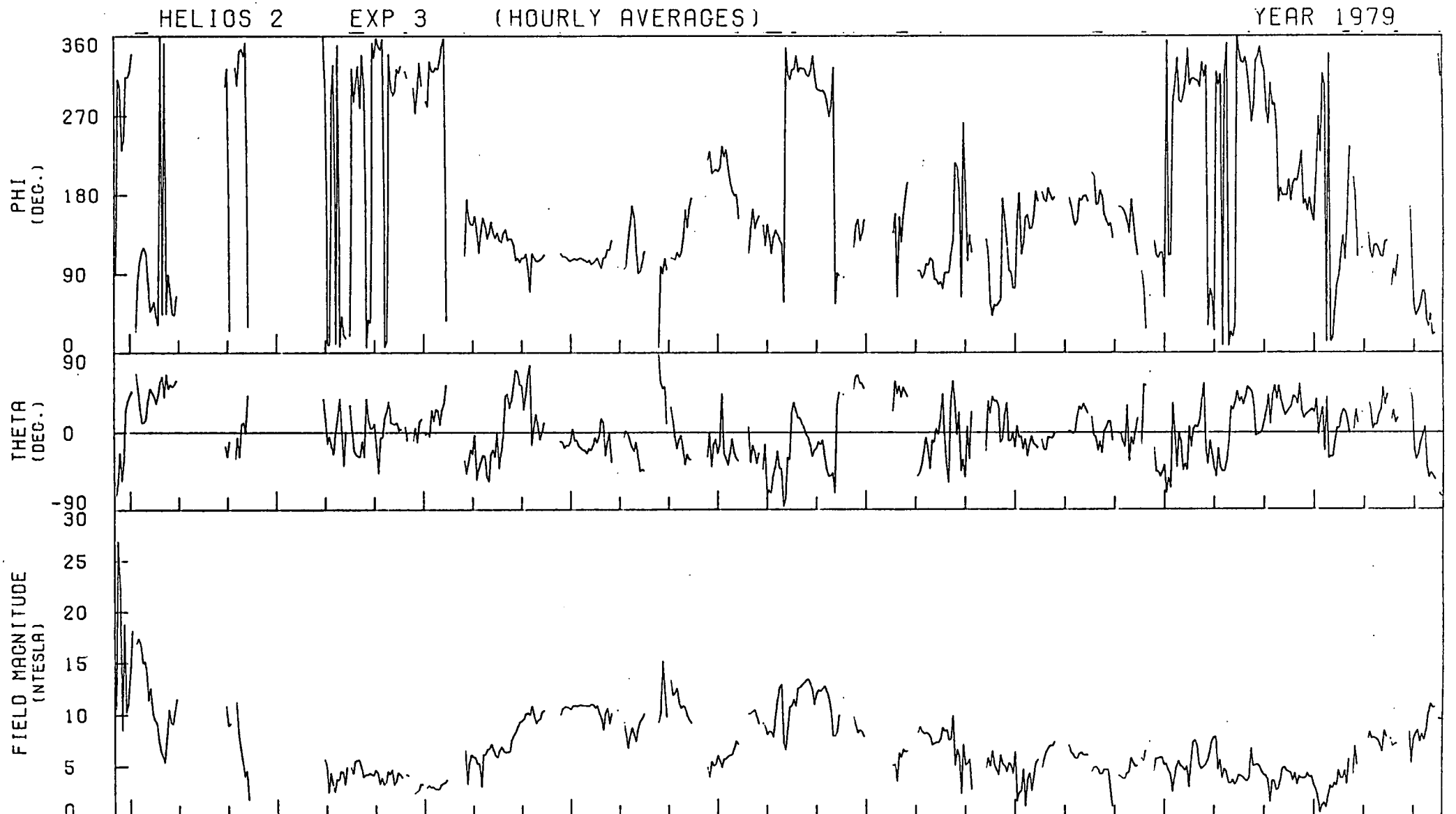
ROT.	DAY	188	191	194	197	200	203	206	209	212
43.0	DIST.	.898	.914	.928	.940	.951	.960	.968	.974	.979
TO	LAT.	-1.9	-2.2	-2.5	-2.8	-3.0	-3.3	-3.5	-3.7	-4.0
44.0	LONG.	166.9	166.4	165.9	165.3	164.7	164.0	163.2	162.5	161.7

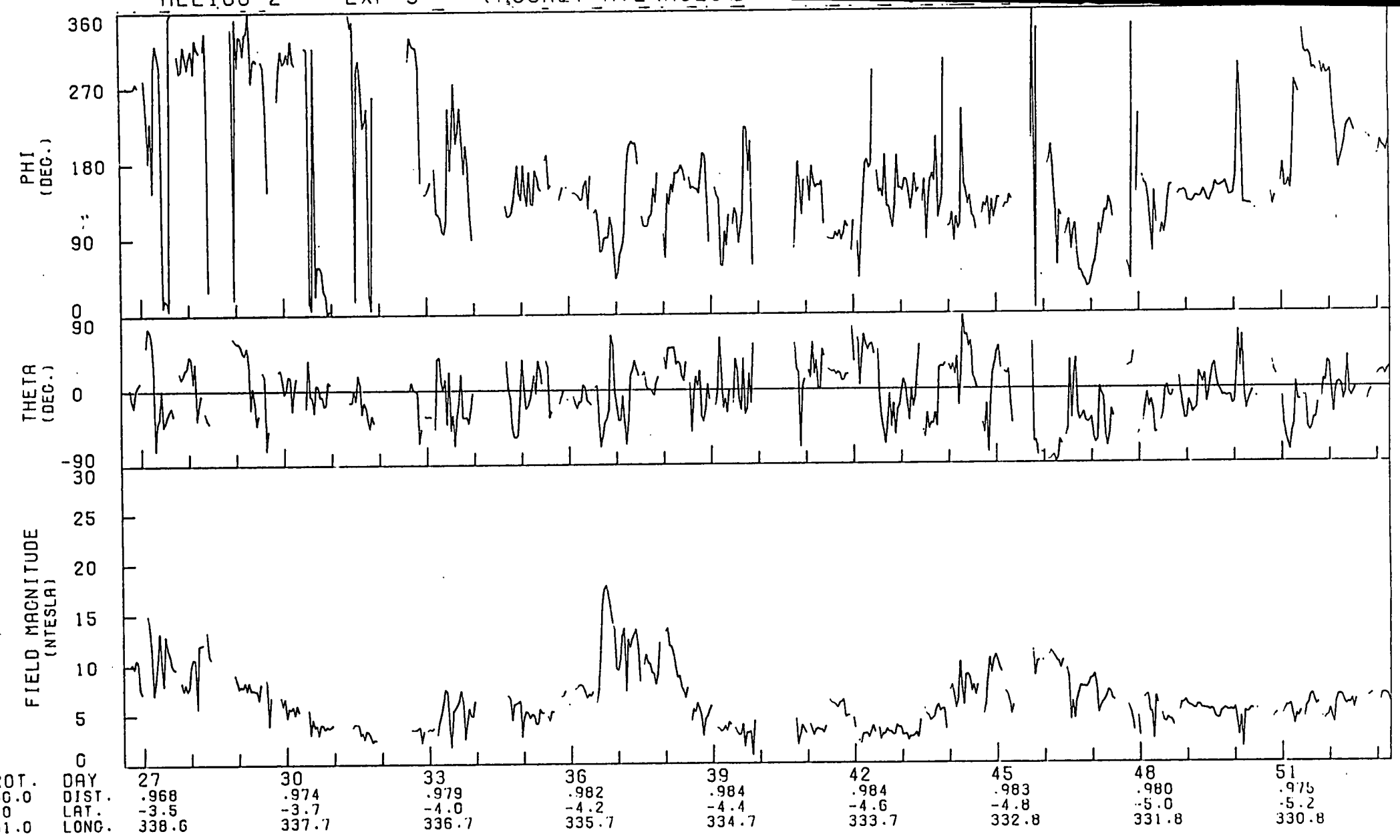

HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1979
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY 241 244 247 250 253 256 259 262 265
45.0 DIST. .947 .935 .922 .908 .891 .873 .854 .832 .809

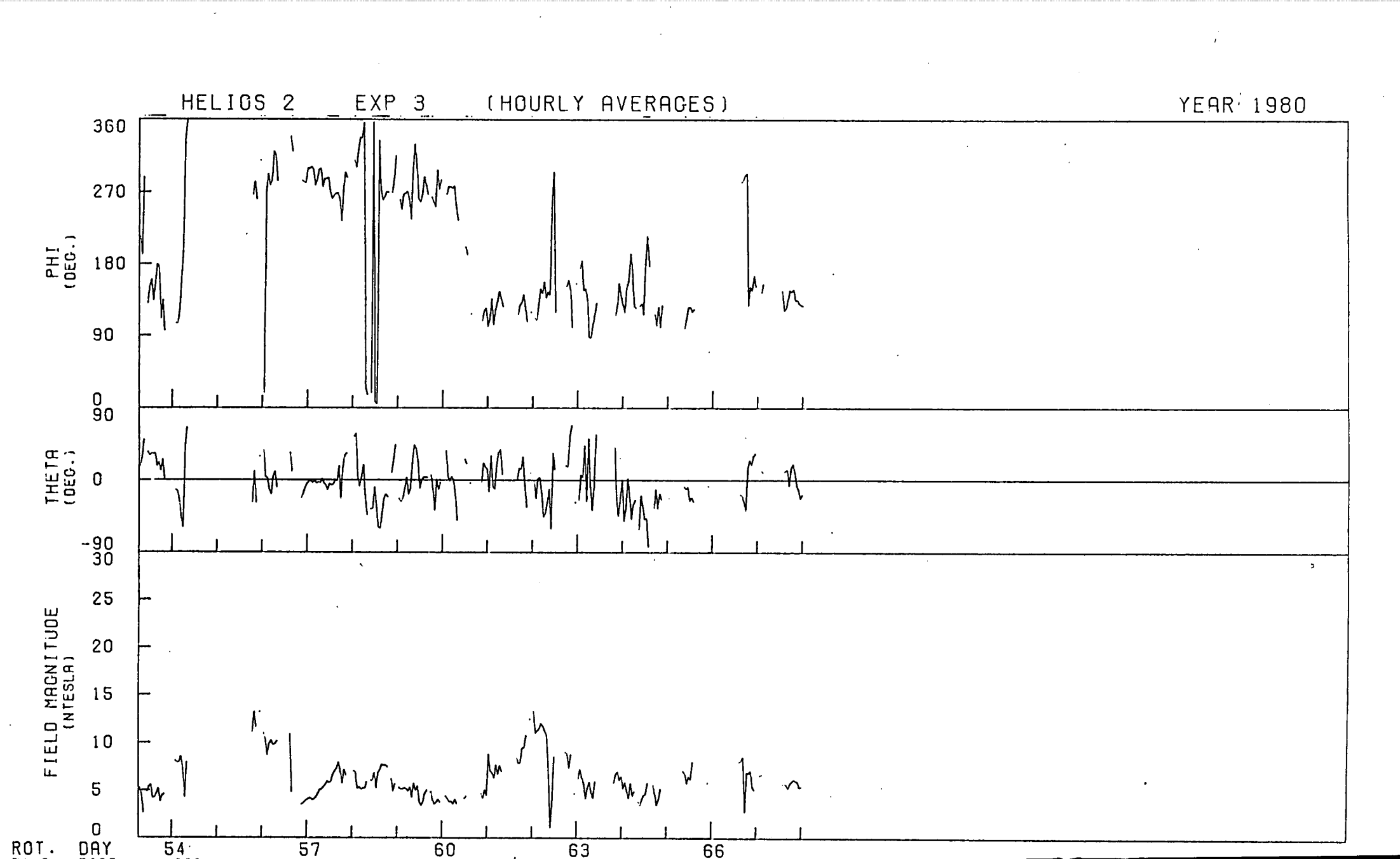

HELIOS 2 EXP 3 (HOURLY AVERAGES)
YEAR 1975
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
60
50
40
30
20
10
0
ROT. DAY 268 271 274 277 280 283 286 289 292 295
46.0 DIST. .784 .757 .729 .698 .666 .631 .595 .556 .516 .475
TO LAT. -7.0 -7.1 -7.2 -7.2 -7.2 -7.2 -7.1 -6.9 -6.6 -6.1
47.0 LONG. 151.1 151.5 152.2 153.1 154.4 156.2 158.5 161.5 165.4 170.5

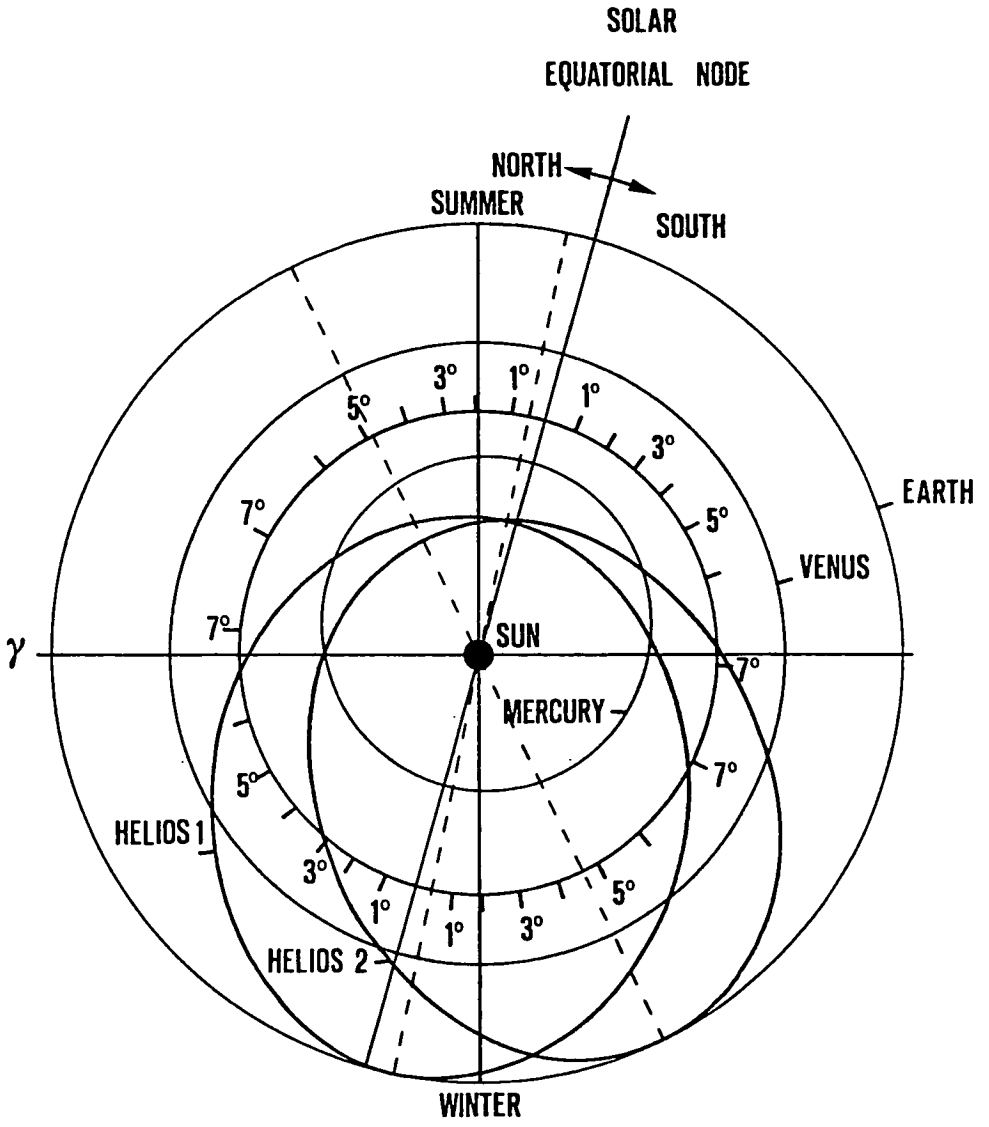

HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1979
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
90
75
60
45
30
15
0
ROT. DAY
298
301
304
307
310
313
316
319
322
325
328
331
334


PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 48.0 TO 49.0
DAY 337 340 343 346 349 352 355 358 361 364
DIST. .560 .598 .635 .669 .701 .732 .760 .787 .812 .835
LAT. 3.6 2.9 2.3 1.8 1.3 .8 .3 -.1 -.5 -.9
LONG. 335.5 338.4 340.6 342.2 343.3 344.1 344.7 344.9 345.0 344.8


HELIOS 2 EXP 3 (HOURLY AVERAGES) YEAR 1979
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0

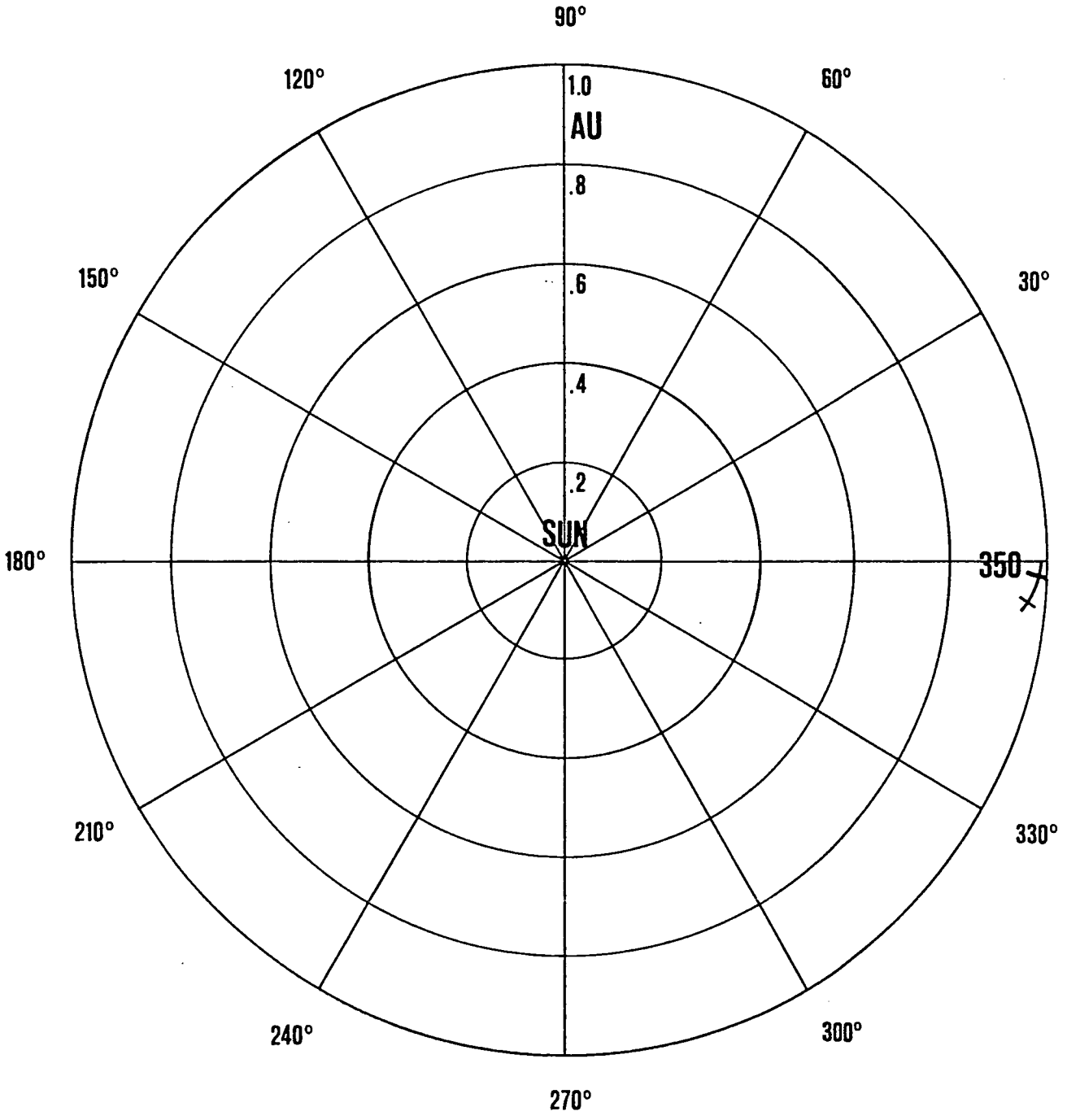

PHI (DEC.)
360
270
180
90
0
THETA (DEC.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. 50.0 TO 51.0
DAY 27 30 33 36 39 42 45 48 51
DIST. .968 .974 .979 .982 .984 .984 .983 .980 .975
LAT. -3.5 -3.7 -4.0 -4.2 -4.4 -4.6 -4.8 -5.0 -5.2
LONG. 338.6 337.7 336.7 335.7 334.7 333.7 332.8 331.8 330.8


HELIOS 2 EXP 3 (HOURLY AVERAGES)
YEAR 1980
PHI (DEG.)
360
270
180
90
0
THETA (DEG.)
90
0
-90
FIELD MAGNITUDE (NTESLA)
30
25
20
15
10
5
0
ROT. DAY
54
57
60
63
66

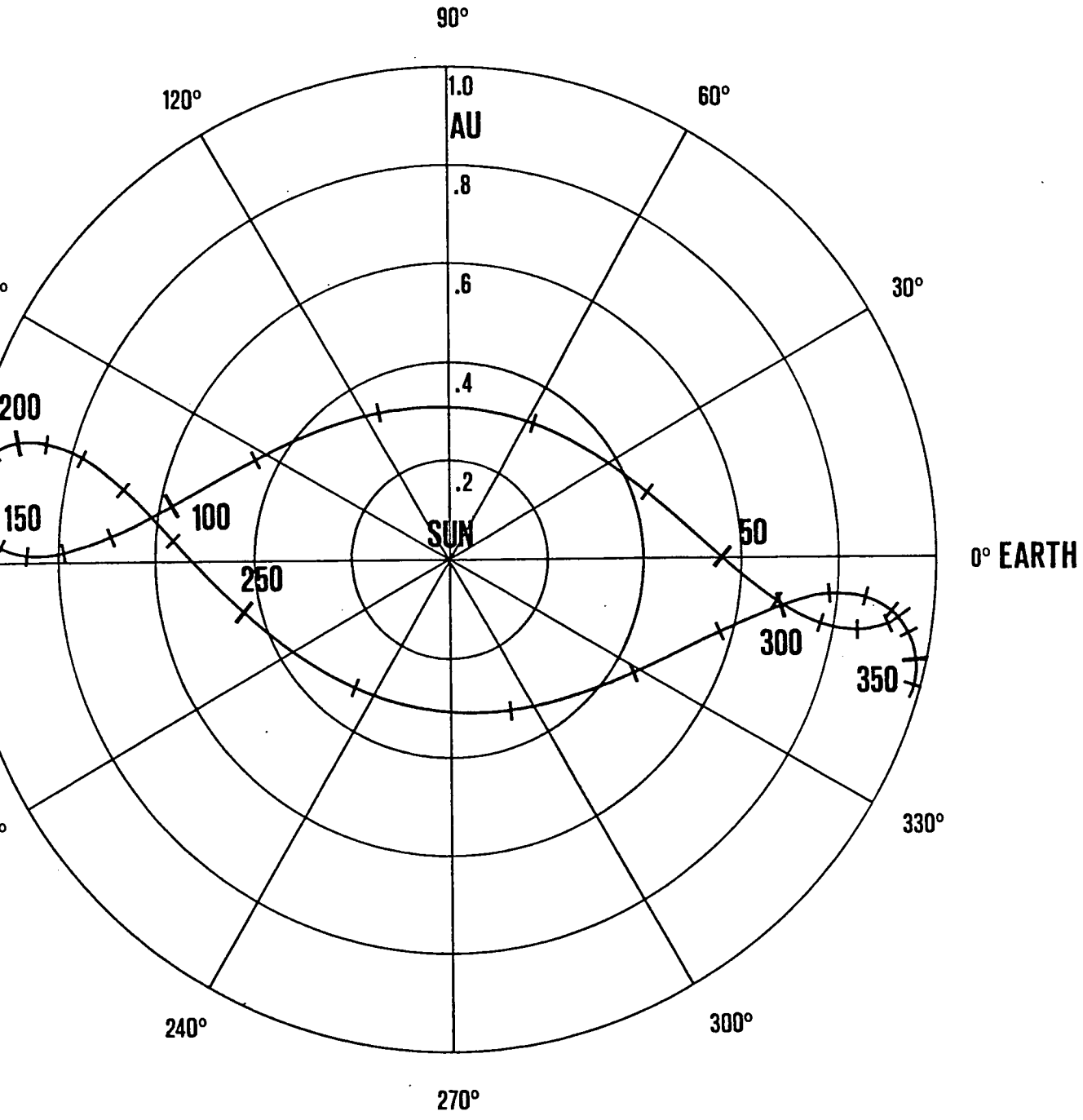


HELIOS 1 (LAUNCH DEC. 10, 1974)

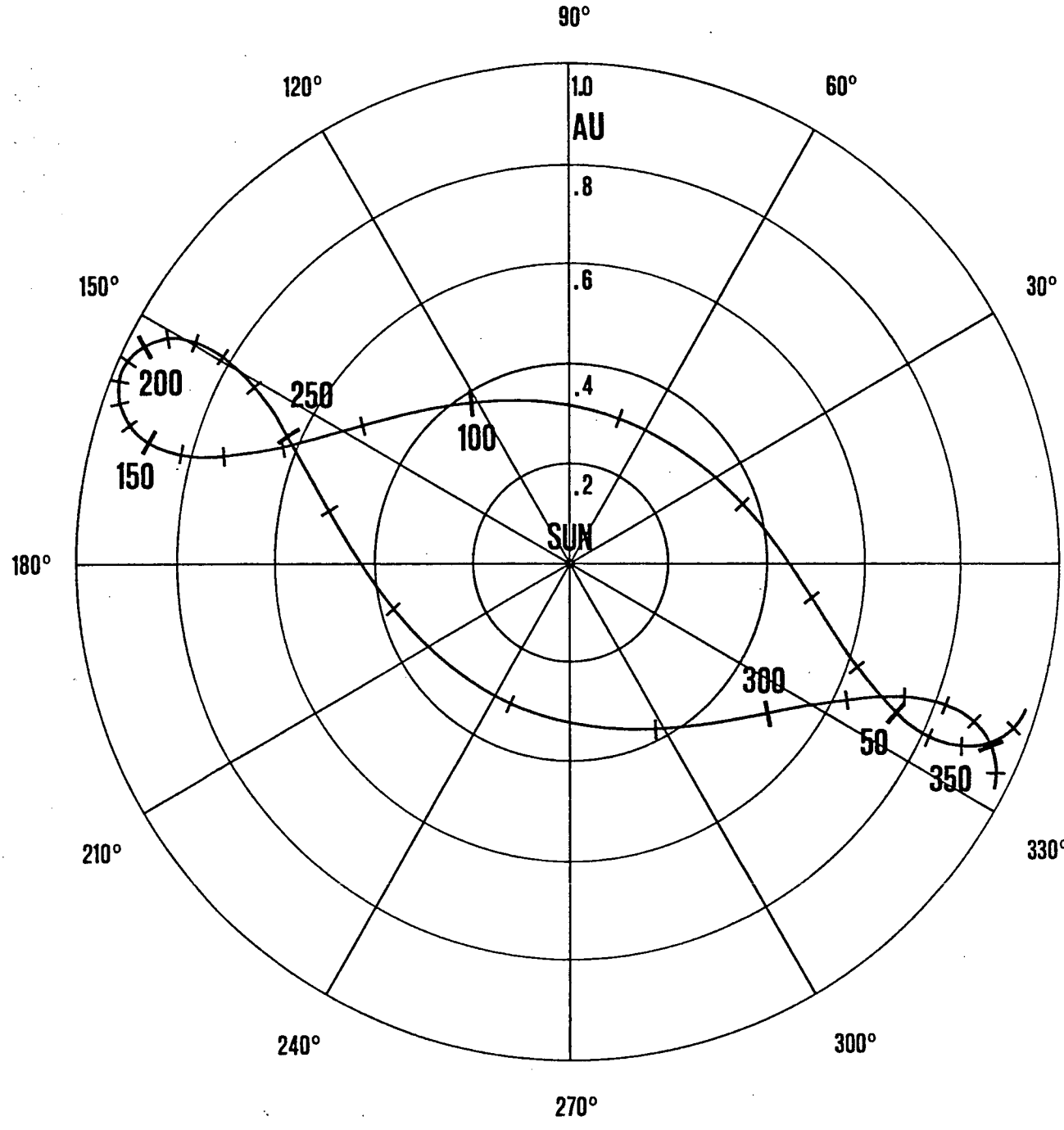
HELIOS 2 (LAUNCH JAN. 15, 1976)



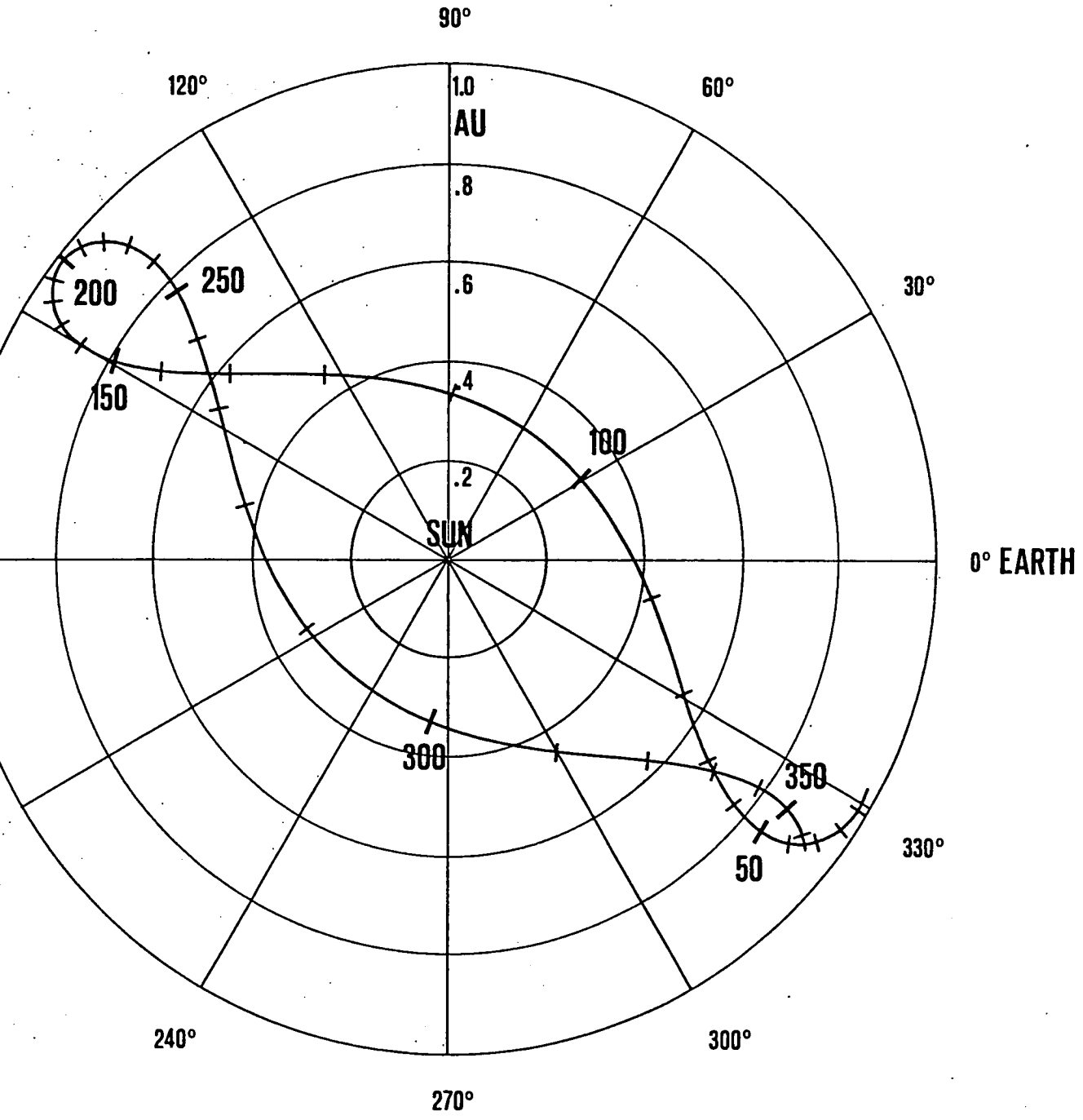
HELIOS-1 1974



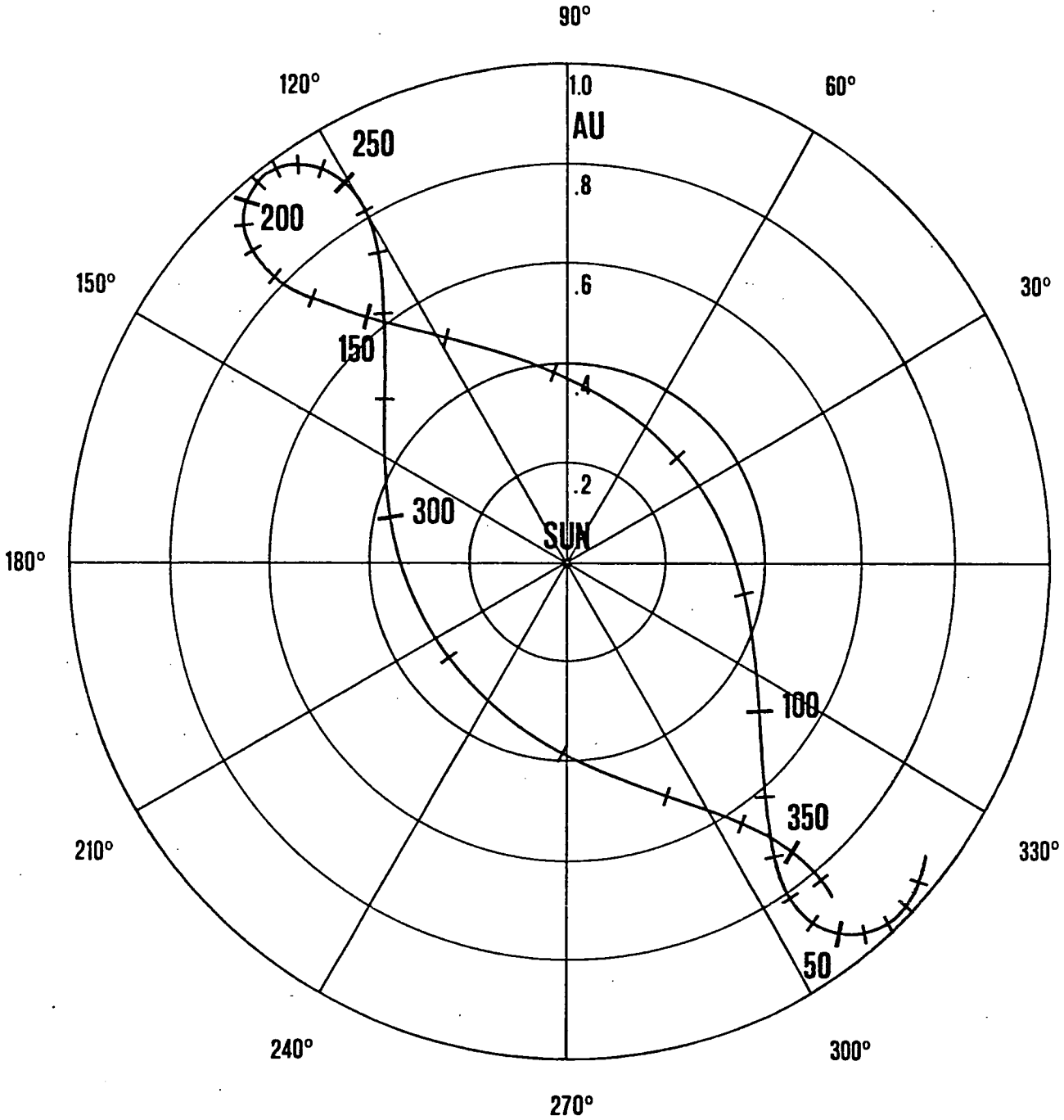
HELIOS-1 1975



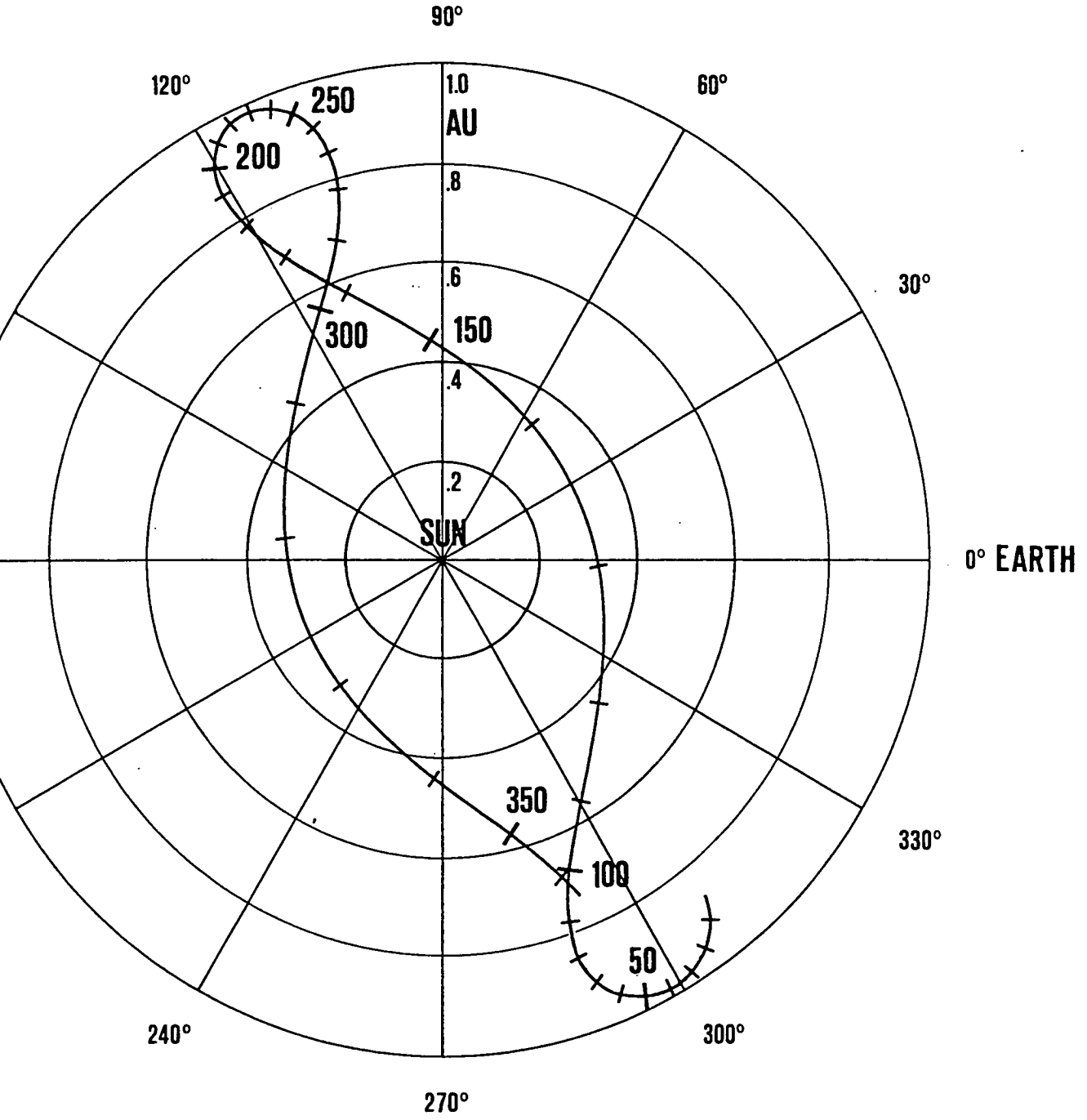
HELIOS-1 1976



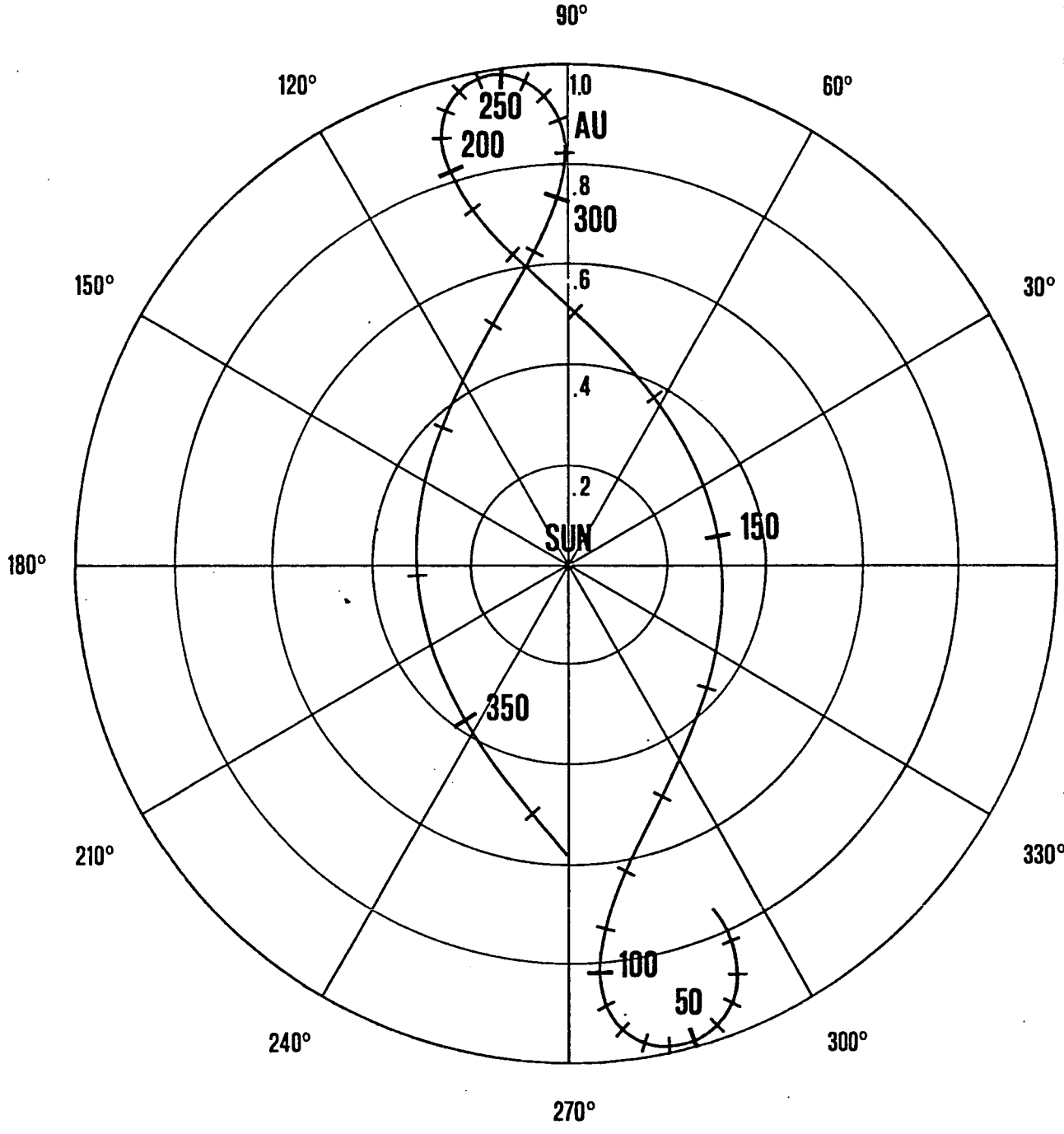
HELIOS-1 1977



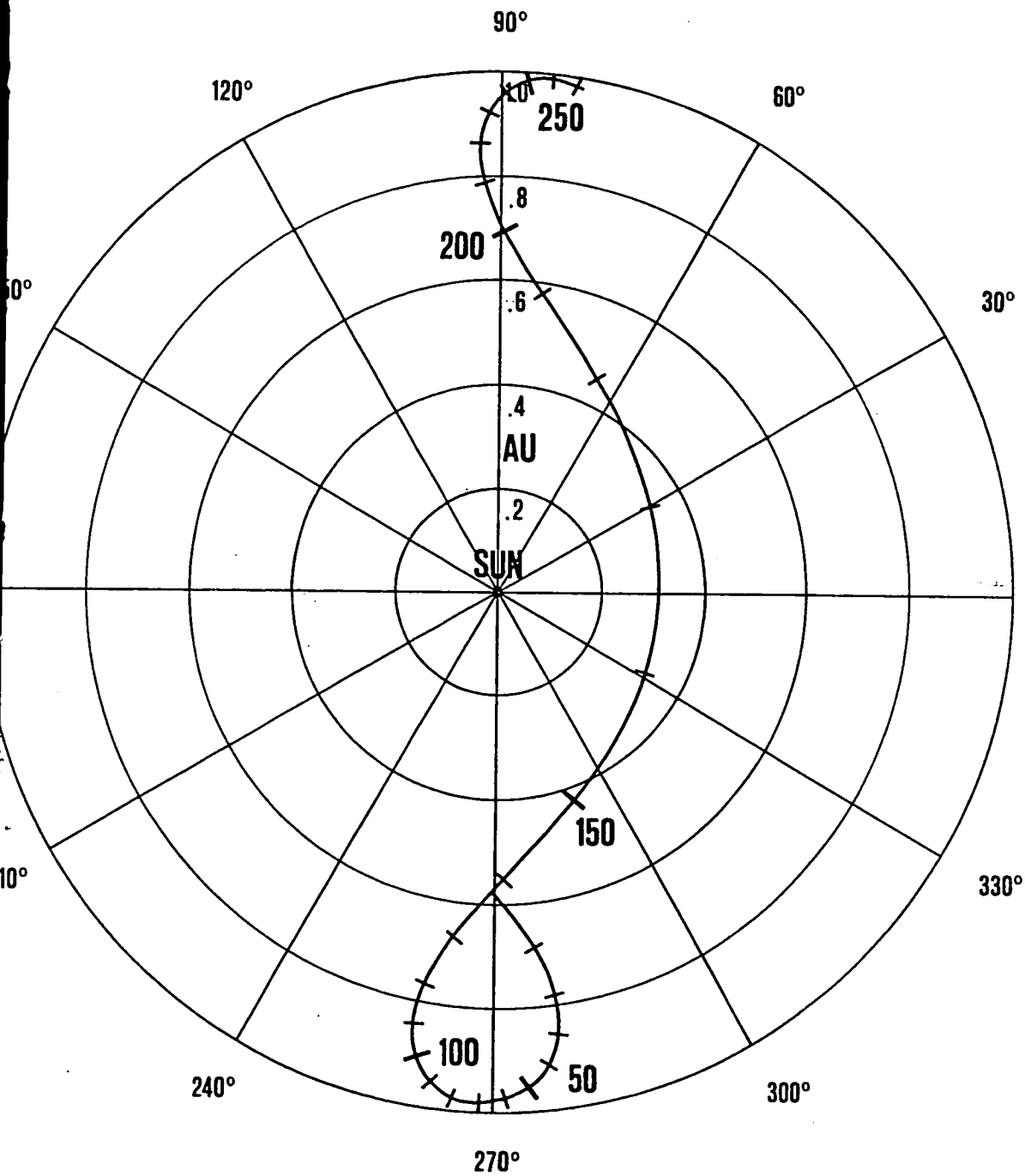
HELIOS-1 1978



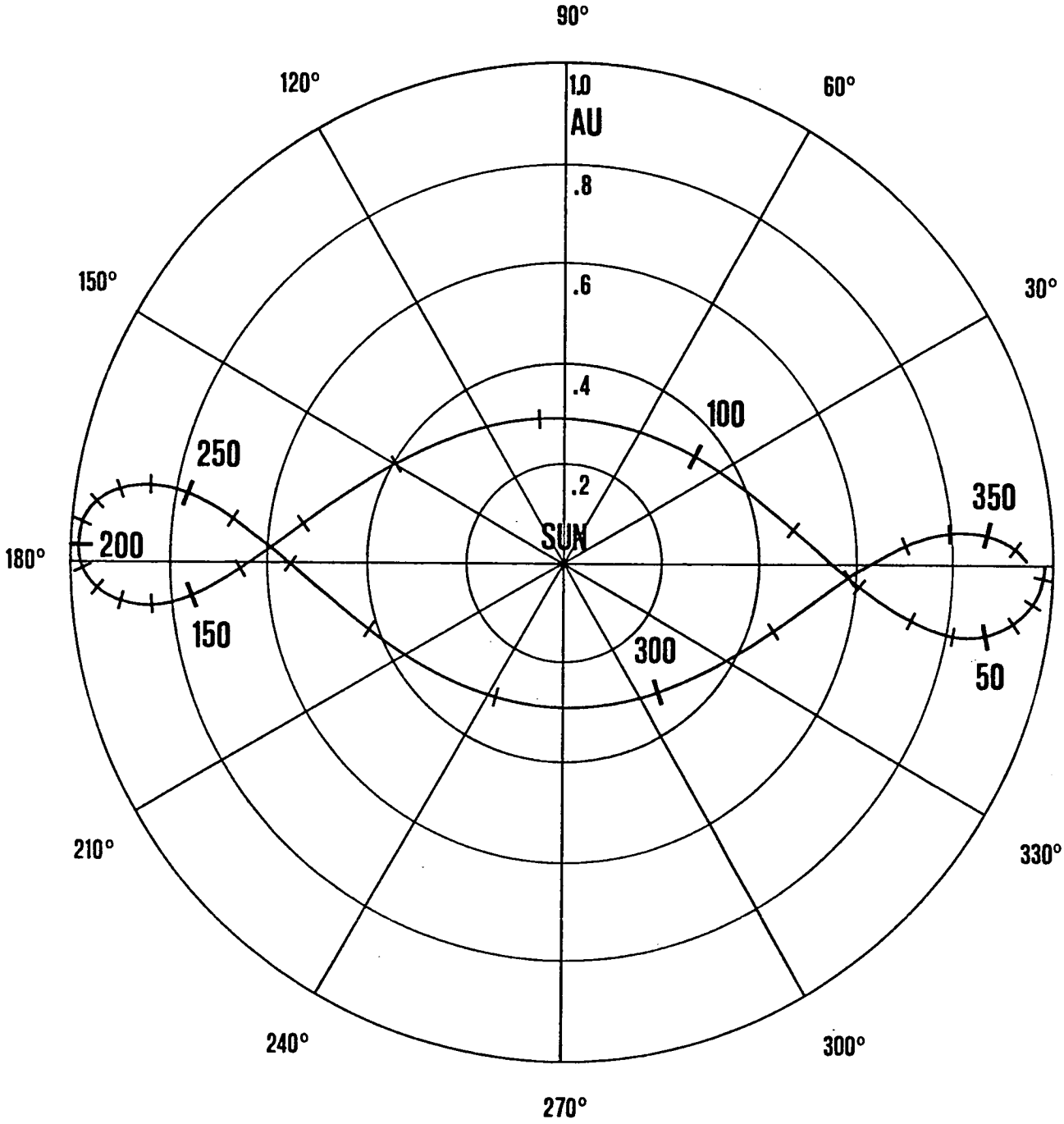
HELIOS-1 1979



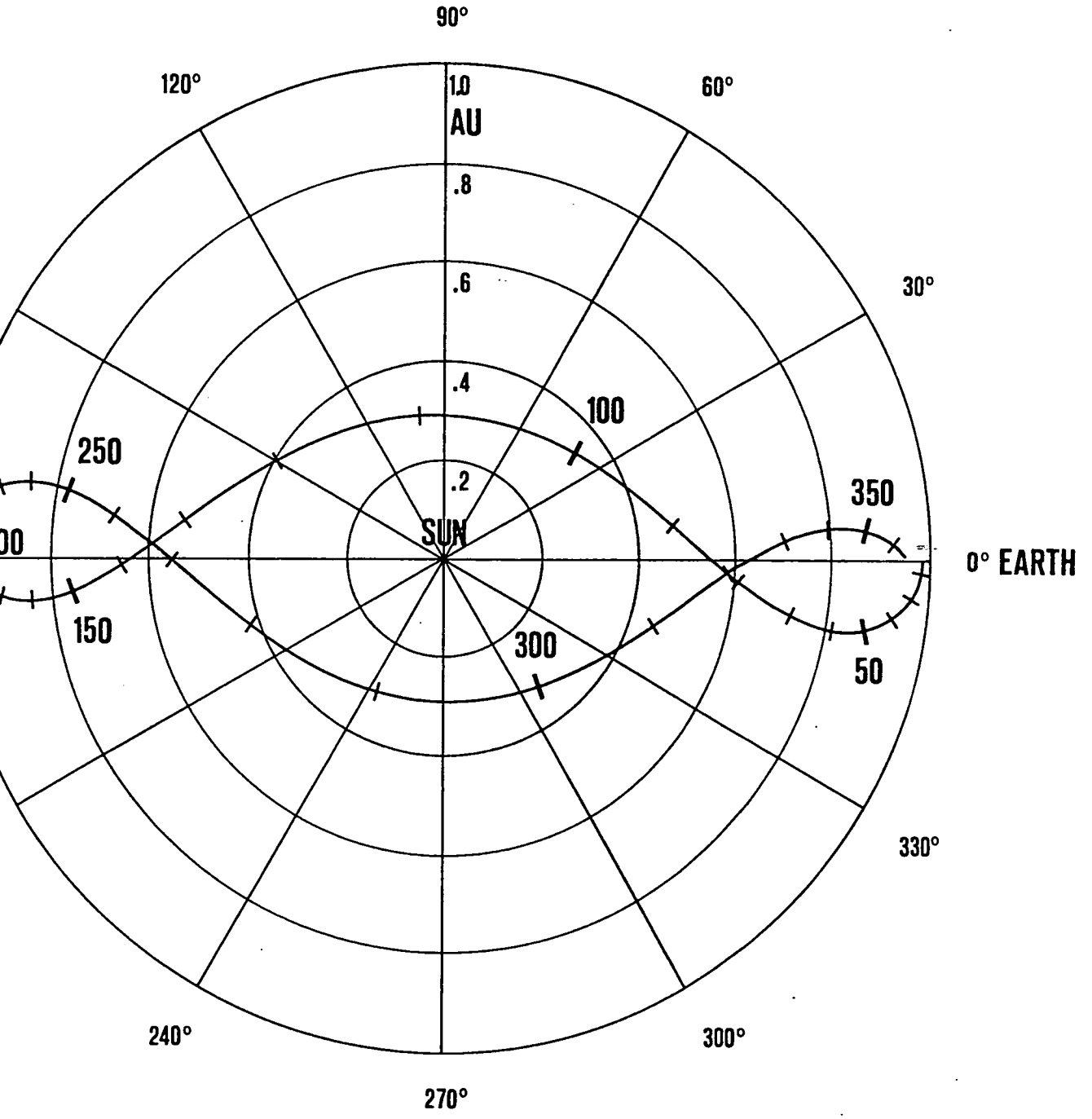
HELIOS-1 1980



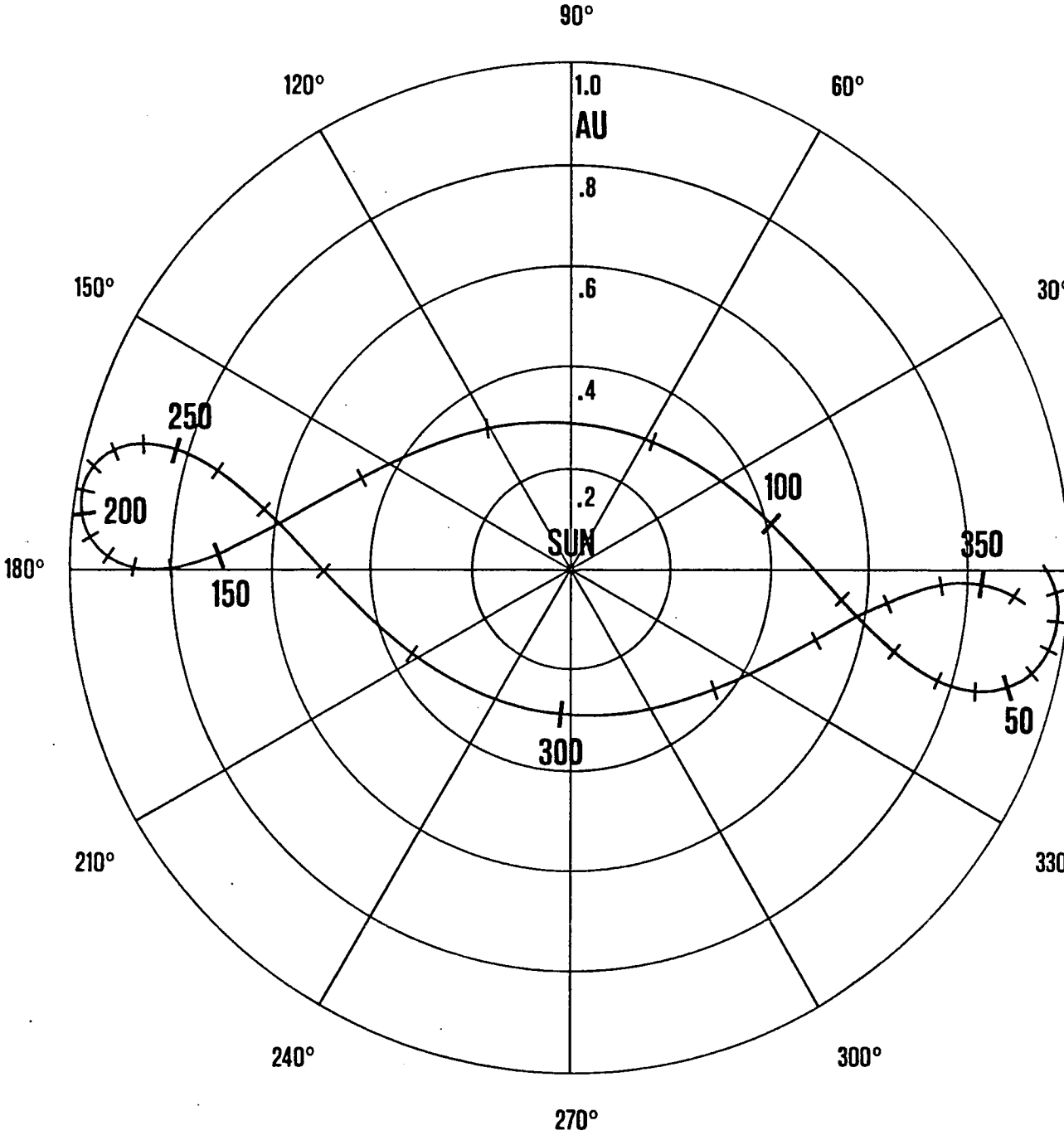
HELIOS-1 1981



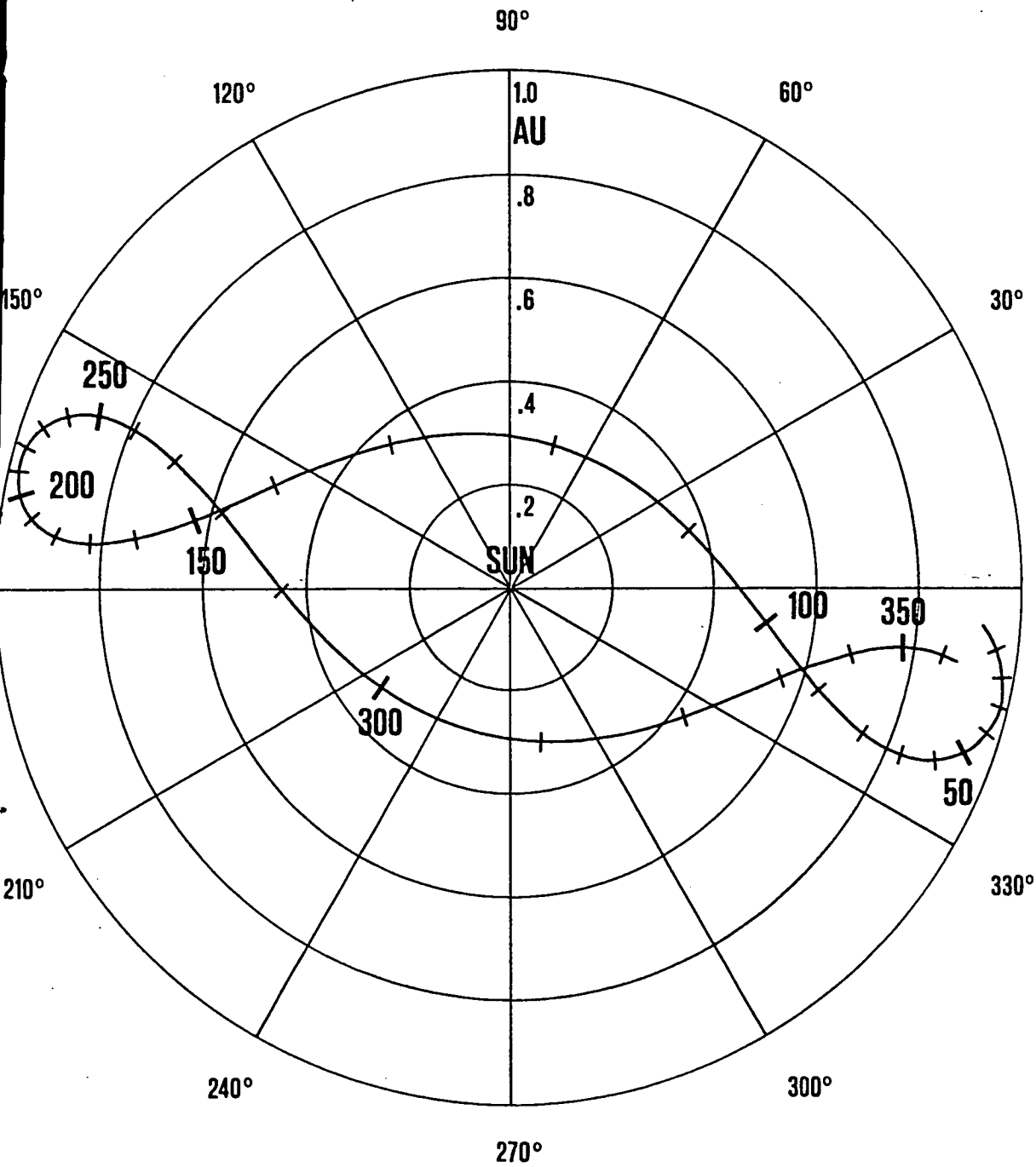
HELIOS-2 1976



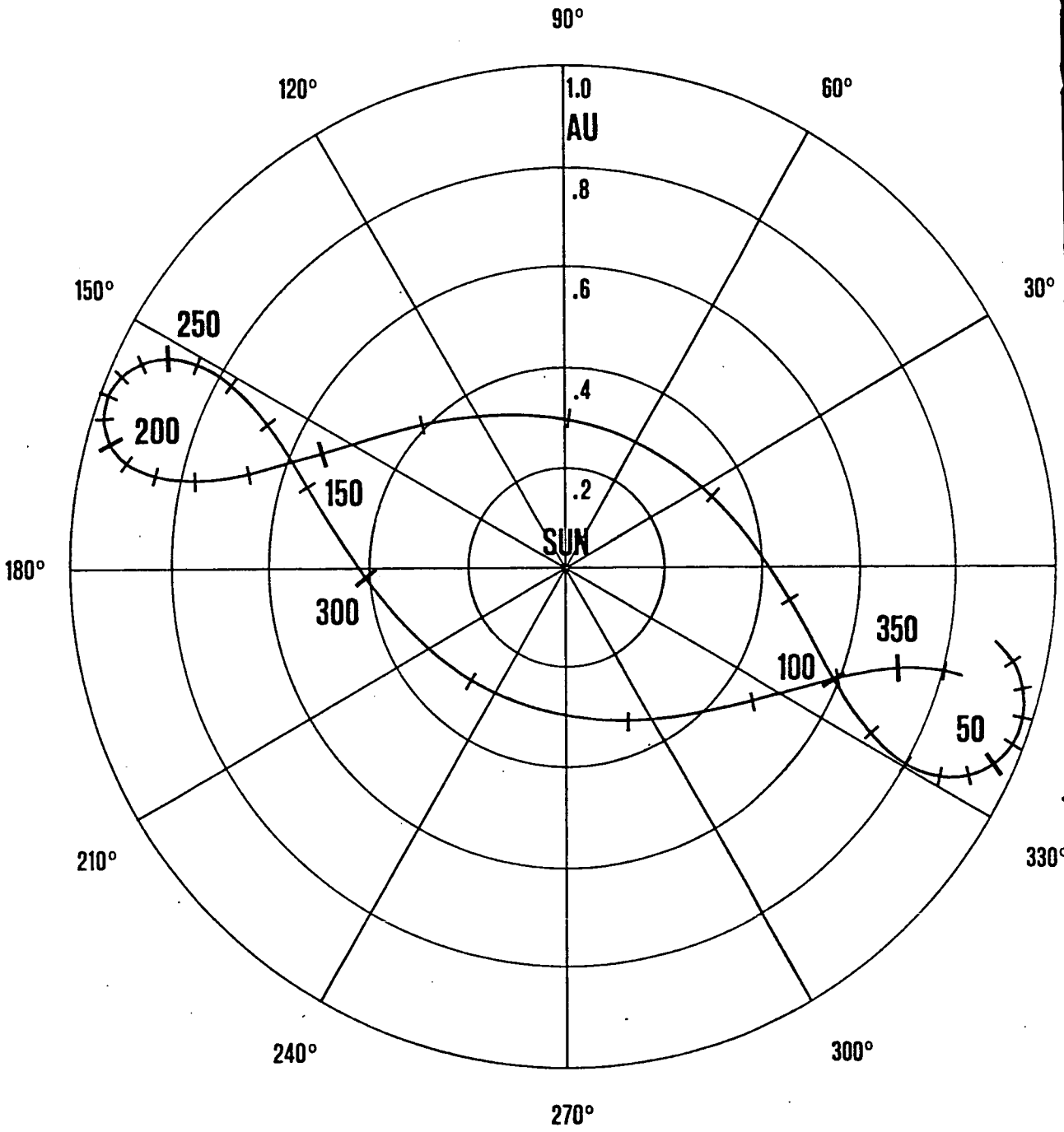
HELIOS-2 1976



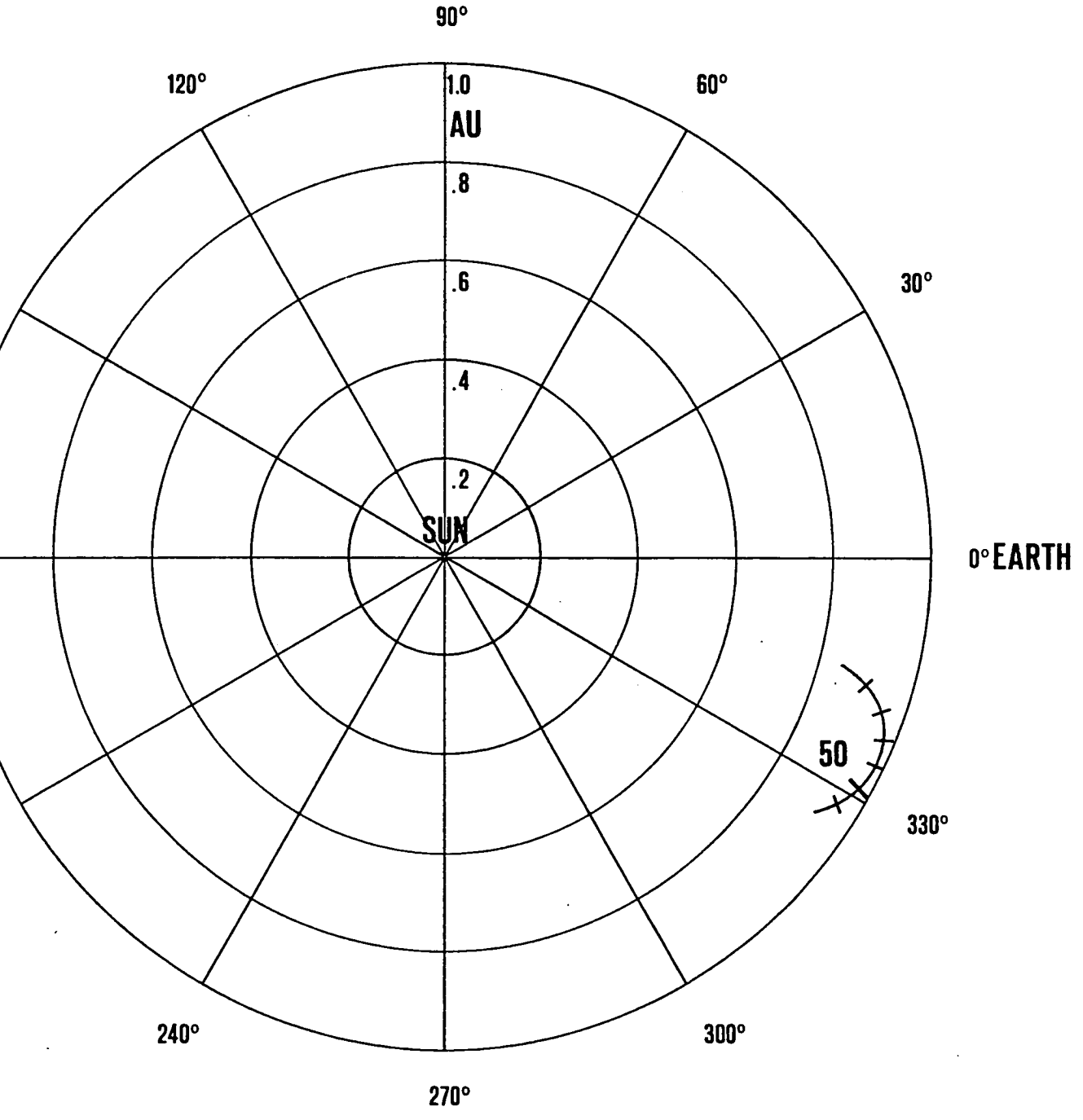
HELIOS-2 1977



HELIOS-2 1978



HELIOS-2 1979



HELIOS-2 1980